



Dart Hawkesbury  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

**D4680-041**  
**Job Sheet 164762**

**PRELIMINARY**  
**ISSUE**

DAS  
9  
9-88

Part No: D4680-041

Job Qty: 1 ea

Part Name: Skidtube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 9/30/17

Job Tracking No:

Due Date: 10/31/17

Created By: Mario Poulin

Type: Stock

Description:

Note: DWG REV F IPP REV:A 13.04.16 NEW ISSUE DD VERF:JLM IPP REV:B 13.08.08 PB2 DD VERF:JLM IPP REV:C 13.09.10 PB3 DD VERF:JLM IPP REV:D 13.11.14 AS PER DWG REV.B DD VERF:JLM IPP REV:C 14.11.24 AS PER DWG REV.C DD VERF:JLM IPP REV:D 15.06.10 AS PER DWG REV.D DD VERF:JLM IPP REV:E 16.03.23 AS PER DWG REV.E DD VERF:JLM

Ship Via:

### Bill of Materials

| Part/Part Name                    | Part Note                                                                                                                                                                                                                                                                                                                | Serial No | Quantity | Location |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|
| D4680-041<br>Skidtube<br>Assembly | DWG REV F IPP REV:A 13.04.16 NEW ISSUE DD VERF:JLM IPP REV:B 13.08.08 PB2 DD VERF:JLM IPP REV:C 13.09.10 PB3 DD VERF:JLM IPP REV:D 13.11.14 AS PER DWG REV.B DD VERF:JLM IPP REV:C 14.11.24 AS PER DWG REV.C DD VERF:JLM IPP REV:D 15.06.10 AS PER DWG REV.D DD VERF:JLM IPP REV:E 16.03.23 AS PER DWG REV.E DD VERF:JLM |           | 0.000    |          |
| AELS-1032-130<br>Rivnut           |                                                                                                                                                                                                                                                                                                                          |           | 0.000    |          |
| AN3C4A<br>Bolt                    |                                                                                                                                                                                                                                                                                                                          |           | 0.000    |          |
| AN3C5A<br>Bolt                    |                                                                                                                                                                                                                                                                                                                          |           | 0.000    |          |
| AN526C1032R10<br>Screw            |                                                                                                                                                                                                                                                                                                                          |           | 0.000    |          |
| CR3212-5-05<br>Rivet              |                                                                                                                                                                                                                                                                                                                          |           | 0.000    |          |
| D2965<br>Cap                      | DWG REV C SHEETS 1,3 IPP: A 00.05.31 New Issue EC IPP Rev:Added Turning as per Rev B 06-12-15 JLM                                                                                                                                                                                                                        |           | 0.000    |          |
| D2965-3<br>Cap                    | DWG REV C SHEETS 2,3 IPP Rev A New Issue 06-12-19 JLM IPP REV:B 17.01.17 AS PER DWG REV.C DD VERF:JLM                                                                                                                                                                                                                    |           | 0.000    |          |
| D4680-041-BENT<br>Extrusion Bent  | DWG REV E U/R IPP REV:A 16.05.16 NEW ISSUE DD VERF:JLM                                                                                                                                                                                                                                                                   |           | 0.000    |          |
| D4681-041<br>Web Assembly         | DWG REV B SHEETS 1,2 IPP REV:A 13.04.15 NEW ISSUE DD VERF:JLM IPP REV:B 13.08.08 PB1 DD VERF:JLM IPP REV:C 13.11.14 AS PER DWG REV.B DD VERF:JLM                                                                                                                                                                         |           | 0.000    |          |
| D4686-1<br>Spacer                 | DWG REV B IPP REV:A 13.02.20 NEW ISSUE DD VERF:JLM IPP REV:B 13-06-15 NEW LENGHT JLM VERIFIED BY:DD IPP REV:C 13.11.14 AS PER DWG REV.B DD VERF:JLM                                                                                                                                                                      |           | 0.000    |          |
| D4753-1<br>Doubler                | DWG REV A IPP REV:A NEW ISSUE 13-02-21 JLM VERIFIED BY:DD                                                                                                                                                                                                                                                                |           | 0.000    |          |
| D5304-1<br>Crossbolt<br>Spacer    | DWG REV A IPP REV:A NEW ISSUE 15-09-24 JLM                                                                                                                                                                                                                                                                               |           |          |          |
| D5520-1<br>Doubler                | DWG REV A-PRELIM IPP REV:A 17.05.12 NEW ISS                                                                                                                                                                                                                                                                              |           |          |          |
| MS20601-AD4W3<br>Rivet            |                                                                                                                                                                                                                                                                                                                          |           |          |          |
| NAS1149C0332R<br>Washer           |                                                                                                                                                                                                                                                                                                                          |           |          |          |

Status: Stock

Part: **D4680-041 B164762**

Created: 9/30/17 1:28 PM DART.MICHAUD-FEBRILLE.VICTORIA



Serial No: **S000263**

Printed By: Goldston, Justin 10/2/17 10:45 AM

Job Routing

| Op No                                                                                                                                                                                                                                 | Operation                | Qty         | Due Date              | Standard                     |         | Workcenter/Supplier   |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------|-----------------------|------------------------------|---------|-----------------------|-------------|
|                                                                                                                                                                                                                                       |                          |             |                       | Setup hrs                    | Run Hrs | Workcenter / Supplier | Lead Time   |
| 90                                                                                                                                                                                                                                    | Start up Operation       | 1 Ea        | 10/30/17              | 0.00                         | 0.00    | Start up container    |             |
| 220                                                                                                                                                                                                                                   | Powdercoat <i>MP3804</i> | 1 pcs       | 10/30/17              | 0.00                         | 0.17    | Powdercoat1           |             |
| 230                                                                                                                                                                                                                                   | QC <i>12/11/08</i>       | 1 pcs       | 10/30/17              | 0.00                         | 0.00    | QC3                   |             |
| 260                                                                                                                                                                                                                                   | HandFinish               | 1 pcs       | 10/31/17              | 0.00                         | 0.74    | HandFinish4           | <i>DAS</i>  |
| 270                                                                                                                                                                                                                                   | QC                       | 1 pcs       | 10/31/17              | 0.00                         | 0.00    | QC5                   | <i>38</i>   |
| 300                                                                                                                                                                                                                                   | Packaging                | 1 pcs       | 10/31/17              | 0.00                         | 0.00    | Packaging3            | <i>9-89</i> |
| 310                                                                                                                                                                                                                                   | QC21-SA                  | 1 Ea        | 10/31/17              | 0.00                         | 0.00    | QC21                  | <i>sf</i>   |
| Part Op 220 - START TIME: <i>5:10</i> O.V.T: <i>3:30</i> FINISH <i>5:40</i> .                                                                                                                                                         |                          |             |                       |                              |         |                       |             |
| Descriptions: 260 - 1- Install Ground Wire inserts as per Dwg D4680. 3- Install Fwd & Aft caps as per Dwg D4680 and Detail "A" & "B".<br>Fasterner must be install wet as per note (9). 4- Wing Walk as per Dwg D4680 and QSI 005 4.4 |                          |             |                       |                              |         |                       |             |
| Job BOM                                                                                                                                                                                                                               |                          |             |                       |                              |         |                       |             |
| Part / Item                                                                                                                                                                                                                           | Component Name           | Quantity    | Operation             | Special Comments             |         |                       |             |
| D4680-041 B164762                                                                                                                                                                                                                     |                          | 1 Ea (1 ea) | 90-Start up Operation |                              |         |                       |             |
| AELS-1032-130 *                                                                                                                                                                                                                       | Rivnut <i>S007384</i>    | 3 Ea (3 ea) | 260-HandFinish        | <i>ANS4-1032-130 S007387</i> |         |                       |             |
| AN3C4A                                                                                                                                                                                                                                | Bolt <i>S000533</i>      | 3 Ea (3 ea) | 260-HandFinish        |                              |         |                       |             |
| AN3C5A                                                                                                                                                                                                                                | Bolt <i>S001919</i>      | 2 Ea (2 ea) | 260-HandFinish        |                              |         |                       |             |
| AN526C1032R10                                                                                                                                                                                                                         | Screw <i>FM137851-5</i>  | 2 Ea (2 ea) | 260-HandFinish        |                              |         |                       |             |
| D2965                                                                                                                                                                                                                                 | Cap <i>F127852</i>       | 1 Ea (1 ea) | 260-HandFinish        |                              |         |                       |             |
| D2965-3                                                                                                                                                                                                                               | Cap <i>F126369</i>       | 1 Ea (1 ea) | 260-HandFinish        |                              |         |                       |             |
| NAS1149C0332R                                                                                                                                                                                                                         | Washer <i>S001036</i>    | 5 Ea (5 ea) | 260-HandFinish        |                              |         |                       |             |
| Job Allocations                                                                                                                                                                                                                       |                          |             |                       |                              |         |                       |             |
| Operation                                                                                                                                                                                                                             | Component Part           | Required    | Inventory             | Allocated                    | Std Qty |                       |             |
| 90-Start up Operation                                                                                                                                                                                                                 | D4680-041 B164762        | 1           | 1                     | 0                            | 0       |                       |             |
| 260-HandFinish                                                                                                                                                                                                                        | AELS-1032-130            | 3           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | AN3C4A                   | 3           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | AN3C5A                   | 2           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | AN526C1032R10            | 2           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | D2965                    | 1           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | D2965-3                  | 1           | 0                     | 0                            | 0       |                       |             |
|                                                                                                                                                                                                                                       | NAS1149C0332R            | 5           | 0                     | 0                            | 0       |                       |             |
| Part Specifications                                                                                                                                                                                                                   |                          |             |                       |                              |         |                       |             |
| Specifications could not be found.                                                                                                                                                                                                    |                          |             |                       |                              |         |                       |             |

Plex 10/1/17 3:37 PM Dart.Renwick.Jennifer

*S007803*

*~~S000263~~*



**DART**  
AEROSPACE  
**S007803**



Skidtube Assembly

**PART NO:**  
**Revision:**  
**Operation:**  
**Change No:**

**D4680 - 041**

**Packaging**

**Dart Aerospace Ltd.**  
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Hawkesbury, ON K64 1K7  
CANADA  
TEL.: 1 613 632-5200  
Email: [sales@dartaero.com](mailto:sales@dartaero.com)  
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**Mfg Date: 11/08/17**  
**Job No: 164762**

# Work Order Summary

Thursday, September 28, 2017 8:00:19 AM

Page 1 of 2

Criteria : Work Order ID: 164762 Item ID: D4680-041 Product Family SKIDTUBES  
Work Order Start Dates 8/3/2017 to 8/3/2017 11:59:59 PM Work Order Required Dates 9/1/2017 to 9/1/2017  
11:59:59 PM

All References

Work Order Status Released

|                    |                   |              |        |             |          |
|--------------------|-------------------|--------------|--------|-------------|----------|
| Work Order ID      | 164762            | Required Qty | 1.0000 | Status Code | Released |
| Item ID            | D4680-041         | Accepted Qty | 0.0000 | Scrap Qty   | 0.0000   |
| Item Name          | Skidtube Assembly |              |        |             |          |
| Current Acct Value | \$2,477.420       |              |        |             |          |

|            |          |               |          |                |  |
|------------|----------|---------------|----------|----------------|--|
| Start Date | 8/3/2017 | Required Date | 9/1/2017 | Completed Date |  |
|------------|----------|---------------|----------|----------------|--|

|          |              |                   |                |                  |  |
|----------|--------------|-------------------|----------------|------------------|--|
| Standard | ** Actual ** | ** Acct. Value ** | ** Variance ** | ** Variance % ** |  |
|----------|--------------|-------------------|----------------|------------------|--|

| Direct Costs    | Total       | Each    | Each        | Each        | Each    |
|-----------------|-------------|---------|-------------|-------------|---------|
| Material        | \$112.360   | \$0.000 | \$220.150   | \$220.150   | 100.00% |
| Labor           | \$563.386   | \$0.000 | \$600.237   | \$600.237   | 100.00% |
| Outplant        | \$58.798    | \$0.000 | \$44.160    | \$44.160    | 100.00% |
| Variable Burden | \$0.000     | \$0.000 | \$0.000     | \$0.000     | 0.00%   |
| Fixed Burden    | \$1,203.253 | \$0.000 | \$1,355.170 | \$1,355.170 | 100.00% |
| Material Burden | \$0.000     | \$0.000 | \$0.000     | \$0.000     | 0.00%   |
| ** Total **     | \$1,937.797 | \$0.000 | \$2,219.717 | \$2,219.717 |         |

| Item ID/Item Name                  | Required Qty | Issue Code | Issue Date | Issued Qty | Cost Amount |
|------------------------------------|--------------|------------|------------|------------|-------------|
| CR3212-5-05<br>Rivet               | 68.0000      |            | 8/30/2017  | 68.0000    | \$22.440    |
| D4680-041-BENT ✓<br>Extrusion Bent | 1.0000       |            | 9/18/2017  | 1.0000     | \$90.538    |
| D4681-041<br>Web Assembly          | 1.0000       |            | 8/30/2017  | 1.0000     | \$214.608   |
| D4686-1 ✓<br>Spacer                | 8.0000       |            | 9/21/2017  | 8.0000     | \$68.390    |
| D4753-1 ✓<br>Doubler               | 16.0000      |            | 9/18/2017  | 16.0000    | \$200.016   |
| D5304-1 ✓<br>Crossbolt Spacer      | 2.0000       |            | 9/21/2017  | 2.0000     | \$22.717    |
| D5520-1 ✓<br>Doubler               | 2.0000       |            | 9/18/2017  | 2.0000     | \$97.139    |
| MS20601-AD4W3 ✓<br>Rivet           | 32.0000      |            | 9/18/2017  | 32.0000    | \$6.390     |
| Total Matl Amts:                   |              |            |            |            | \$722.239   |



**Work Center HandFinish**

| Employee ID   | Rout Seq ID | Labor Date | Setup Hours | Actual Setup Hours | Labor Hours | Actual Labor Hours | Nbr of WOs | Setup Amount | Labor Amount | Fix Burd Amount | Var Burd Amount | Total Amounts |
|---------------|-------------|------------|-------------|--------------------|-------------|--------------------|------------|--------------|--------------|-----------------|-----------------|---------------|
| LECO02        |             |            |             |                    |             |                    |            |              |              |                 |                 |               |
|               | 8/14/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 150           |             |            | 0.00        | 0.00               | 0.85        | 0.21               | 4.00       | \$0.000      | \$4.617      | \$11.524        | \$0.000         | \$16.140      |
|               | 9/26/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 210           |             |            | 0.00        | 0.00               | 0.38        | 0.38               | 1.00       | \$0.000      | \$8.246      | \$20.584        | \$0.000         | \$28.830      |
| <b>Total:</b> |             |            | 0.00        | 0.00               | 1.22        | 0.59               | 5.00       | \$0.000      | \$12.863     | \$32.107        | \$0.000         | \$44.970      |

**Work Center Skid tubes**

| Employee ID   | Rout Seq ID | Labor Date | Setup Hours | Actual Setup Hours | Labor Hours | Actual Labor Hours | Nbr of WOs | Setup Amount | Labor Amount | Fix Burd Amount | Var Burd Amount | Total Amounts |
|---------------|-------------|------------|-------------|--------------------|-------------|--------------------|------------|--------------|--------------|-----------------|-----------------|---------------|
| ELLI01        |             |            |             |                    |             |                    |            |              |              |                 |                 |               |
|               | 8/3/2017    |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 120           |             |            | 0.00        | 0.00               | 1.93        | 1.93               | 1.00       | \$0.000      | \$50.305     | \$97.632        | \$0.000         | \$147.936     |
| 120           |             |            | 0.00        | 0.00               | 1.50        | 1.50               | 1.00       | \$0.000      | \$39.030     | \$75.750        | \$0.000         | \$114.780     |
|               | 8/9/2017    |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 120           |             |            | 0.00        | 0.00               | 0.90        | 0.90               | 1.00       | \$0.000      | \$23.434     | \$45.480        | \$0.000         | \$68.914      |
|               | 8/10/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 120           |             |            | 0.00        | 0.00               | 2.58        | 2.58               | 1.00       | \$0.000      | \$67.205     | \$130.431       | \$0.000         | \$197.636     |
|               | 9/18/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 170           |             |            | 0.00        | 0.00               | 1.38        | 1.38               | 1.00       | \$0.000      | \$35.952     | \$69.776        | \$0.000         | \$105.728     |
| 170           |             |            | 0.00        | 0.00               | 0.09        | 0.09               | 1.00       | \$0.000      | \$2.269      | \$4.404         | \$0.000         | \$6.673       |
|               | 9/20/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 170           |             |            | 0.00        | 0.00               | 3.07        | 3.07               | 1.00       | \$0.000      | \$79.881     | \$155.035       | \$0.000         | \$234.916     |
|               | 9/21/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 170           |             |            | 0.00        | 0.00               | 1.01        | 1.01               | 1.00       | \$0.000      | \$26.272     | \$50.990        | \$0.000         | \$77.262      |
| grou01        |             |            |             |                    |             |                    |            |              |              |                 |                 |               |
|               | 8/30/2017   |            |             |                    |             |                    |            |              |              |                 |                 |               |
| 170           |             |            | 0.00        | 0.00               | 2.83        | 2.83               | 1.00       | \$0.000      | \$73.702     | \$143.041       | \$0.000         | \$216.743     |
| <b>Total:</b> |             |            | 0.00        | 0.00               | 15.30       | 15.30              | 9.00       | \$0.000      | \$398.049    | \$772.539       | \$0.000         | \$1,170.587   |

Work Order ID 164762

Friday, July 28, 2017 9:29:18 AM

\*164762\*

PRELIMINARY ISSUE

Page 1

Item ID: D4680-041  
Revision ID: URF 17-547  
Item Name: Skidtube Assembly

Accept

\*N9000040100\*

Setup Start

\*NS1\*

Stop

\*NS2\*

Start Date: 8/3/2017 Start Qty: 1.00 \*1\*

Required Date: 9/1/2017 Req'd Qty: 1.00 \*1\*

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: LM Date: 17/7/28

Tooling:

Date:

Run Start

\*NR1\*

QC: Date:

SPC (Y/N):

Date:

Stop

\*NR2\*

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
|----------|--------------|

|               |   |
|---------------|---|
| D4680 PRELIM. | F |
|---------------|---|

120

\*120\*

Skidtubes

Skidtubes

Skidtubes

Memo

\*\*\*PICK D4680-041 BENT\*\*\*

1-Cut Aft end as per dwg D4680

2-Deburr ends

3-Drill Aft & Fwd Cap holes using DT8678 & DT8901 open aft cap 0.187".

4-Locate DT10149 & Drill Ground wire hole on top of Tube.

5-Locate DT10149 with 0.187" cleco in aft cap ,then Pilot Drill all X-Bolt holes using 0.187" drill.

6--Drill holes for D5520-1 doubler using DT10309 A & B, Detail H. Locating from 3th and 4th crossbolt holes from aft using .1875 clekos. Spot drill tube using #20 drill (note 10). Remove DT10309 B. Re-install DT 10309 A drill thru tube and doubler using #20 drill (note 10), cleko as you go. Remove .1875 clekos and open holes in tube and doubler to 0.750". Remove doublers and identify orientation. Countersink detail H as per dwg. Note 13.

7-Open remaining X-Bolt holes to .750" (8 places)

8-Open ground wire hole .297" at 95.75" (1 at fwd end & 2 at aft end at 20.81" ref.)

BE 170803



DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                                 |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|-------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                                 |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Step #: _____                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | MRB (QSI042) Approval |                                                 |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | Completed By                                    |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | Lead hand / Supervisor<br>Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | QC / QA Coordinator<br>Approval                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                                 |  |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                                 |  |
| Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/><br>Operator <input type="checkbox"/><br>Offset/Setup <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Training <input type="checkbox"/><br>Use for Testing <input type="checkbox"/><br>Poor Information <input type="checkbox"/><br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/><br>Bending <input type="checkbox"/><br>Centre Not Concentric <input type="checkbox"/><br>Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/> | Temperature/Cure <input type="checkbox"/><br>Set-up <input type="checkbox"/><br>BOM/Route <input type="checkbox"/><br>Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/><br>Folio/Program <input type="checkbox"/><br>Grain <input type="checkbox"/><br>Weld <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/><br>Off-set <input type="checkbox"/><br>Mislabeled <input type="checkbox"/><br>Fit/Function <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Positioned Wrong <input type="checkbox"/><br>Outside Dimensions <input type="checkbox"/><br>Over/Under tolerance <input type="checkbox"/><br>Part Incorrect <input type="checkbox"/><br>Part Lost/Missing <input type="checkbox"/><br>Part Moved <input type="checkbox"/><br>Drawing <input type="checkbox"/><br>Finish <input type="checkbox"/><br>Misread <input type="checkbox"/><br>Turning Sequence <input type="checkbox"/> |  |                       |                                                 |  |
| OTHER : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                                 |  |



**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 2

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

9- 3 most fwd x-bolt holes must be laid out manually, open to #30.

10-Open Aft &amp; Fwd Cap holes using .208" drill.

11- Drill Rivet Holes as per Dwg D4680 using DT10065 Detail D. 8 places per side.

12-Deburr holes.

DAS  
03  
9-89*- Touch up alodine on 5520-1 Doubles.*

140

**\*140\***

QC

Quality Control

QCS- Inspect part completeness to step on W/O 0.00

Memo 0.02

150

**\*150\***

HandFinish

Hand Finishing

Chemical Conversion Coat per QSI005 4.1 0.00

Memo 0.78

BE170810

DAS  
38  
9-89

AUG 11 2017

①

✗

2017-08-14

JSC  
BEB

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|-----------------------|------------------------------------------------------------------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                                | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                                            | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                               |  |                       |                                                                                                            |  |
| Date :                                                       |                                                | Step #:                                                                                                                                                                            |                                                            | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  | MRB (QSI042) Approval |                                                                                                            |  |
| Description Work Order Deviation                             |                                                |                                                                                                                                                                                    |                                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |  |                       | Completed By<br><br>Lead hand / Supervisor<br>Approval Verification<br><br>QC / QA Coordinator<br>Approval |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |
| Root Cause                                                   |                                                | FAULT CATEGORY                                                                                                                                                                     |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/>    | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/>                  | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/>     |  |                       |                                                                                                            |  |
| Design <input type="checkbox"/>                              | Operator <input type="checkbox"/>              | Bending <input type="checkbox"/>                                                                                                                                                   | Set-up <input type="checkbox"/>                            | Folio/Program <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outside Dimensions <input type="checkbox"/>   |  |                       |                                                                                                            |  |
| Doc/Data <input type="checkbox"/>                            | Offset/Setup <input type="checkbox"/>          | Centre Not Concentric <input type="checkbox"/>                                                                                                                                     | BOM/Route <input type="checkbox"/>                         | Grain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Over/Under tolerance <input type="checkbox"/> |  |                       |                                                                                                            |  |
| Equip/Tooling <input type="checkbox"/>                       | Supplier <input type="checkbox"/>              | Cracks <input type="checkbox"/>                                                                                                                                                    | Broken/Damage/Defect <input type="checkbox"/>              | Weld <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Part Incorrect <input type="checkbox"/>       |  |                       |                                                                                                            |  |
| Handling/Pre <input type="checkbox"/>                        | Training <input type="checkbox"/>              | Crimp/Kink/Ripple/Wave <input type="checkbox"/>                                                                                                                                    | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part Lost/Missing <input type="checkbox"/>    |  |                       |                                                                                                            |  |
| Material <input type="checkbox"/>                            | Use for Testing <input type="checkbox"/>       | Cuffs <input type="checkbox"/>                                                                                                                                                     | Contamination <input type="checkbox"/>                     | Out of Sequence <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Part Moved <input type="checkbox"/>           |  |                       |                                                                                                            |  |
| Internal Transport <input type="checkbox"/>                  | Poor Information <input type="checkbox"/>      | Crushing <input type="checkbox"/>                                                                                                                                                  | Countersink <input type="checkbox"/>                       | Off-set <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Drawing <input type="checkbox"/>              |  |                       |                                                                                                            |  |
| Tribal Knowledge <input type="checkbox"/>                    | Rushing <input type="checkbox"/>               | Heat Treat <input type="checkbox"/>                                                                                                                                                | Cut Too Short <input type="checkbox"/>                     | Mislabeled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Finish <input type="checkbox"/>               |  |                       |                                                                                                            |  |
| LOA <input type="checkbox"/>                                 | Product Improvement <input type="checkbox"/>   | Wave/Twist in Tube <input type="checkbox"/>                                                                                                                                        | Instructions Incomplete/Unclear <input type="checkbox"/>   | Fit/Function <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Misread <input type="checkbox"/>              |  |                       |                                                                                                            |  |
| Substation <input type="checkbox"/>                          | Process Improvement <input type="checkbox"/>   | Marks/Chatter <input type="checkbox"/>                                                                                                                                             | Drill Holes <input type="checkbox"/>                       | Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Turning Sequence <input type="checkbox"/>     |  |                       |                                                                                                            |  |
| Past Expiry Date <input type="checkbox"/>                    | Manufacturing Process <input type="checkbox"/> |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>              | OTHER : <input type="checkbox"/>                                                                                                                                                   |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                                                                                            |  |



**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 3

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description             | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 160                            | QC7-Inspect Chemical Conversion Coat | 0.00                 |         |        |              |               |               |                  |                |
| <b>*160*</b>                   |                                      |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                 | 0.01                 |         |        |              |               |               |                  |                |
| Quality Control                |                                      |                      |         |        |              |               |               |                  |                |

*Handwritten: 1 0 170830*

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|----------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                              |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Step #: _____                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | MRB (QSI042) Approval |                                              |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | Completed By                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | Lead hand / Supervisor Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       | QC / QA Coordinator Approval                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                              |  |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                              |  |
| Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/><br>Operator <input type="checkbox"/><br>Offset/Setup <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Training <input type="checkbox"/><br>Use for Testing <input type="checkbox"/><br>Poor Information <input type="checkbox"/><br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/><br>Bending <input type="checkbox"/><br>Centre Not Concentric <input type="checkbox"/><br>Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/> | Temperature/Cure <input type="checkbox"/><br>Set-up <input type="checkbox"/><br>BOM/Route <input type="checkbox"/><br>Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/><br>Folio/Program <input type="checkbox"/><br>Grain <input type="checkbox"/><br>Weld <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/><br>Off-set <input type="checkbox"/><br>Misabeled <input type="checkbox"/><br>Fit/Function <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Positioned Wrong <input type="checkbox"/><br>Outside Dimensions <input type="checkbox"/><br>Over/Under tolerance <input type="checkbox"/><br>Part Incorrect <input type="checkbox"/><br>Part Lost/Missing <input type="checkbox"/><br>Part Moved <input type="checkbox"/><br>Drawing <input type="checkbox"/><br>Finish <input type="checkbox"/><br>Misread <input type="checkbox"/><br>Turning Sequence <input type="checkbox"/> |  |                       |                                              |  |
| OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                       |                                              |  |



**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 4

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

170

**\*170\***

Skidtubes

Skidtubes

Skidtubes

**Memo**

0.80

1-Install doublers using DT10309 B. Detail H. Shave rivets as required.

2- Bond web as per Dwg D4680 &amp; QSI 015

A/R 241 Sike Flex Batch: 137946  
Exp Date: 18-03-29  
start time: \_\_\_\_\_  
end time: \_\_\_\_\_

m66 17/08/30

3- Seal all faying surfaces using proseal and rivet Doubler as per Dwg D4680.  
Detail D.A/R Proseal Batch: 138408  
exp date: 10/17

\*\*\*LET IT CURE FOR 7HRS\*\*\*

START TIME: \_\_\_\_\_

FINISH TIME: \_\_\_\_\_

BE17-09-18

4-Shave rivet as required, remove Proseal spill over.

5- Ream holes section C-C as per dwg, deburr 8 places (Through doubler and tube).

6- Swage x-bolt spacers as per Dwg D4680 and section I C-C 8 places.

7- Swage x-bolt spacer as per dwg D4680 section G-G &amp; boreout as per dwg

8- Trim/Grind flush per QSI 002

BE17-09-21

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                 |  |
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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                 |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Step #: _____                                                                                                                                                                      | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | MRB (QSI042) Approval                           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                    | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Completed By                                    |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Lead hand / Supervisor<br>Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | QC / QA Coordinator<br>Approval                 |  |
| <b>Root Cause</b><br><div style="display: flex;"> <div style="flex: 1;">             Environment <input type="checkbox"/><br/>             Design <input type="checkbox"/><br/>             Doc/Data <input type="checkbox"/><br/>             Equip/Tooling <input type="checkbox"/><br/>             Handling/Pre <input type="checkbox"/><br/>             Material <input type="checkbox"/><br/>             Internal Transport <input type="checkbox"/><br/>             Tribal Knowledge <input type="checkbox"/><br/>             LOA <input type="checkbox"/><br/>             Substation <input type="checkbox"/><br/>             Past Expiry Date <input type="checkbox"/><br/>             Misidentified <input type="checkbox"/> </div> <div style="flex: 1;">             No Re-verification <input type="checkbox"/><br/>             Operator <input type="checkbox"/><br/>             Offset/Setup <input type="checkbox"/><br/>             Supplier <input type="checkbox"/><br/>             Training <input type="checkbox"/><br/>             Use for Testing <input type="checkbox"/><br/>             Poor Information <input type="checkbox"/><br/>             Rushing <input type="checkbox"/><br/>             Product Improvement <input type="checkbox"/><br/>             Process Improvement <input type="checkbox"/><br/>             Manufacturing Process <input type="checkbox"/><br/>             Past Due <input type="checkbox"/> </div> </div> |                                                                                                                                                                                    | <b>FAULT CATEGORY</b><br><div style="display: flex;"> <div style="flex: 1;">             Pressure/Forced <input type="checkbox"/><br/>             Bending <input type="checkbox"/><br/>             Centre Not Concentric <input type="checkbox"/><br/>             Cracks <input type="checkbox"/><br/>             Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>             Cuffs <input type="checkbox"/><br/>             Crushing <input type="checkbox"/><br/>             Heat Treat <input type="checkbox"/><br/>             Wave/Twist in Tube <input type="checkbox"/><br/>             Marks/Chatter <input type="checkbox"/> </div> <div style="flex: 1;">             Temperature/Cure <input type="checkbox"/><br/>             Set-up <input type="checkbox"/><br/>             BOM/Route <input type="checkbox"/><br/>             Broken/Damage/Defect <input type="checkbox"/><br/>             Inspection Incomplete/Unqualified <input type="checkbox"/><br/>             Contamination <input type="checkbox"/><br/>             Countersink <input type="checkbox"/><br/>             Cut Too Short <input type="checkbox"/><br/>             Instructions Incomplete/Unclear <input type="checkbox"/><br/>             Drill Holes <input type="checkbox"/> </div> <div style="flex: 1;">             Power Loss/Surge <input type="checkbox"/><br/>             Folio/Program <input type="checkbox"/><br/>             Grain <input type="checkbox"/><br/>             Weld <input type="checkbox"/><br/>             Wrong Stock Pulled <input type="checkbox"/><br/>             Out of Sequence <input type="checkbox"/><br/>             Off-set <input type="checkbox"/><br/>             Misabeled <input type="checkbox"/><br/>             Fit/Function <input type="checkbox"/><br/>             Misaligned/off center <input type="checkbox"/> </div> <div style="flex: 1;">             Positioned Wrong <input type="checkbox"/><br/>             Outside Dimensions <input type="checkbox"/><br/>             Over/Under tolerance <input type="checkbox"/><br/>             Part Incorrect <input type="checkbox"/><br/>             Part Lost/Missing <input type="checkbox"/><br/>             Part Moved <input type="checkbox"/><br/>             Drawing <input type="checkbox"/><br/>             Finish <input type="checkbox"/><br/>             Misread <input type="checkbox"/><br/>             Turning Sequence <input type="checkbox"/> </div> </div> |  |                                                 |  |
| OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                 |  |

**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 5

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID                      | Operation<br>Description                                                                                                       | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp               |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|------------------------------|
| 180<br><b>*180*</b><br>QC<br>Quality Control        | QC5- Inspect part completeness to step on W/O<br><br>Memo                                                                      | 0.00<br><br>0.02     |         |        |              |               |               |                  | DAS<br>16<br>9-89<br>7/27/16 |
| 210<br><b>*210*</b><br>HandFinish<br>Hand Finishing | Pressure Wash per QSI005 4.3<br><br>Memo<br>Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch.                   | 0.00<br><br>0.41     |         |        |              |               |               |                  | (1) * 2017-09-26<br>JSL      |
| 220<br><b>*220*</b><br>Powdercoat<br>Powder Coating | White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum<br><br>Memo<br>START TIME: _____<br>OVEN TEMPERATURE: _____<br>FINISH TIME: _____ | 0.00<br><br>0.27     |         |        |              |               |               |                  |                              |



DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |                                                                                                                   |  |
|--------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|-------------------------------------------------------------------------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |  |  |  |                                                                                                                   |  |
| Date :                                                       |  | Step #:                                                                                                                                                                            |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  | <b>MRB (QSI042) Approval</b><br><br><div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div> |  |
| Description Work Order Deviation                             |  |                                                                                                                                                                                    |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |                                                                                                                   |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |                                                                                                                   |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |                                                                                                                   |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  | Completed By                                                                                                      |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  | Lead hand / Supervisor<br>Approval Verification                                                                   |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  | QC / QA Coordinator<br>Approval<br><br>18<br>048                                                                  |  |

|                                             |  |                                                |  |                                                 |  |                                                            |  |                                                |  |                                               |  |
|---------------------------------------------|--|------------------------------------------------|--|-------------------------------------------------|--|------------------------------------------------------------|--|------------------------------------------------|--|-----------------------------------------------|--|
| <b>Root Cause</b>                           |  |                                                |  | <b>FAULT CATEGORY</b>                           |  |                                                            |  |                                                |  |                                               |  |
| Environment <input type="checkbox"/>        |  | No Re-verification <input type="checkbox"/>    |  | Pressure/Forced <input type="checkbox"/>        |  | Temperature/Cure <input type="checkbox"/>                  |  | Power Loss/Surge <input type="checkbox"/>      |  | Positioned Wrong <input type="checkbox"/>     |  |
| Design <input type="checkbox"/>             |  | Operator <input type="checkbox"/>              |  | Bending <input type="checkbox"/>                |  | Set-up <input type="checkbox"/>                            |  | Folio/Program <input type="checkbox"/>         |  | Outside Dimensions <input type="checkbox"/>   |  |
| Doc/Data <input type="checkbox"/>           |  | Offset/Setup <input type="checkbox"/>          |  | Centre Not Concentric <input type="checkbox"/>  |  | BOM/Route <input type="checkbox"/>                         |  | Grain <input type="checkbox"/>                 |  | Over/Under tolerance <input type="checkbox"/> |  |
| Equip/Tooling <input type="checkbox"/>      |  | Supplier <input type="checkbox"/>              |  | Cracks <input type="checkbox"/>                 |  | Broken/Damage/Defect <input type="checkbox"/>              |  | Weld <input type="checkbox"/>                  |  | Part Incorrect <input type="checkbox"/>       |  |
| Handling/Pre <input type="checkbox"/>       |  | Training <input type="checkbox"/>              |  | Crimp/Kink/Ripple/Wave <input type="checkbox"/> |  | Inspection Incomplete/Unqualified <input type="checkbox"/> |  | Wrong Stock Pulled <input type="checkbox"/>    |  | Part Lost/Missing <input type="checkbox"/>    |  |
| Material <input type="checkbox"/>           |  | Use for Testing <input type="checkbox"/>       |  | Cuffs <input type="checkbox"/>                  |  | Contamination <input type="checkbox"/>                     |  | Out of Sequence <input type="checkbox"/>       |  | Part Moved <input type="checkbox"/>           |  |
| Internal Transport <input type="checkbox"/> |  | Poor Information <input type="checkbox"/>      |  | Crushing <input type="checkbox"/>               |  | Countersink <input type="checkbox"/>                       |  | Off-set <input type="checkbox"/>               |  | Drawing <input type="checkbox"/>              |  |
| Tribal Knowledge <input type="checkbox"/>   |  | Rushing <input type="checkbox"/>               |  | Heat Treat <input type="checkbox"/>             |  | Cut Too Short <input type="checkbox"/>                     |  | Mislabeled <input type="checkbox"/>            |  | Finish <input type="checkbox"/>               |  |
| LOA <input type="checkbox"/>                |  | Product Improvement <input type="checkbox"/>   |  | Wave/Twist in Tube <input type="checkbox"/>     |  | Instructions Incomplete/Unclear <input type="checkbox"/>   |  | Fit/Function <input type="checkbox"/>          |  | Misread <input type="checkbox"/>              |  |
| Substation <input type="checkbox"/>         |  | Process Improvement <input type="checkbox"/>   |  | Marks/Chatter <input type="checkbox"/>          |  | Drill Holes <input type="checkbox"/>                       |  | Misaligned/off center <input type="checkbox"/> |  | Turning Sequence <input type="checkbox"/>     |  |
| Past Expiry Date <input type="checkbox"/>   |  | Manufacturing Process <input type="checkbox"/> |  | <b>OTHER :</b> _____<br>_____<br>_____          |  |                                                            |  |                                                |  |                                               |  |
| Misidentified <input type="checkbox"/>      |  | Past Due <input type="checkbox"/>              |  |                                                 |  |                                                            |  |                                                |  |                                               |  |

**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 6

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                                                                                       | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 230                            | QC3- Inspect Part Finish                                                                                       | 0.00                 |         |        |              |               |               |                  |                |
| <b>*230*</b>                   |                                                                                                                |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                                                                                           | 0.01                 |         |        |              |               |               |                  |                |
| Quality Control                |                                                                                                                |                      |         |        |              |               |               |                  |                |
| 260                            | HandFinishing                                                                                                  | 0.00                 |         |        |              |               |               |                  |                |
| <b>*260*</b>                   |                                                                                                                |                      |         |        |              |               |               |                  |                |
| HandFinish                     | Memo                                                                                                           | 1.01                 |         |        |              |               |               |                  |                |
| Hand Finishing                 | 1- Install Ground Wire inserts as per Dwg D4680.                                                               |                      |         |        |              |               |               |                  |                |
|                                | 2-Inspect for Foreign objects                                                                                  |                      |         |        |              |               |               |                  |                |
|                                | 3- Install Fwd & Aft caps as per Dwg D4680 and Detail "A" & "B". Fastener must be install wet as per note (9). |                      |         |        |              |               |               |                  |                |
|                                | A/R 241 Sika Flex Batch: _____<br>Exp Date: _____                                                              |                      |         |        |              |               |               |                  |                |
|                                | 4- Wing Walk as per Dwg D4680 and QSI 005 4.4<br>Batch: _____                                                  |                      |         |        |              |               |               |                  |                |

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------|---------------------------------------------|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                                | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                                            | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
| Date :                                                       |                                                | Step #:                                                                                                                                                                            |                                                            | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           | MRB (QSI042) Approval                        |                                                                                                                    |                                               |                                                |                                             |
| Description Work Order Deviation                             |                                                |                                                                                                                                                                                    |                                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |                                           |                                              | Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |                                               |                                                |                                             |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
| Root Cause                                                   |                                                | FAULT CATEGORY                                                                                                                                                                     |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/>    | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/>                  | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/>     | Design <input type="checkbox"/>           | Operator <input type="checkbox"/>            | Bending <input type="checkbox"/>                                                                                   | Set-up <input type="checkbox"/>               | Folio/Program <input type="checkbox"/>         | Outside Dimensions <input type="checkbox"/> |
| Doc/Data <input type="checkbox"/>                            | Offset/Setup <input type="checkbox"/>          | Centre Not Concentric <input type="checkbox"/>                                                                                                                                     | BOM/Route <input type="checkbox"/>                         | Grain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Over/Under tolerance <input type="checkbox"/> | Equip/Tooling <input type="checkbox"/>    | Supplier <input type="checkbox"/>            | Cracks <input type="checkbox"/>                                                                                    | Broken/Damage/Defect <input type="checkbox"/> | Weld <input type="checkbox"/>                  | Part Incorrect <input type="checkbox"/>     |
| Handling/Pre <input type="checkbox"/>                        | Training <input type="checkbox"/>              | Crimp/Kink/Ripple/Wave <input type="checkbox"/>                                                                                                                                    | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part Lost/Missing <input type="checkbox"/>    | Material <input type="checkbox"/>         | Use for Testing <input type="checkbox"/>     | Cuffs <input type="checkbox"/>                                                                                     | Contamination <input type="checkbox"/>        | Out of Sequence <input type="checkbox"/>       | Part Moved <input type="checkbox"/>         |
| Internal Transport <input type="checkbox"/>                  | Poor Information <input type="checkbox"/>      | Crushing <input type="checkbox"/>                                                                                                                                                  | Countersink <input type="checkbox"/>                       | Off-set <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Drawing <input type="checkbox"/>              | Tribal Knowledge <input type="checkbox"/> | Rushing <input type="checkbox"/>             | Heat Treat <input type="checkbox"/>                                                                                | Cut Too Short <input type="checkbox"/>        | Mislabeled <input type="checkbox"/>            | Finish <input type="checkbox"/>             |
| LOA <input type="checkbox"/>                                 | Product Improvement <input type="checkbox"/>   | Wave/Twist in Tube <input type="checkbox"/>                                                                                                                                        | Instructions Incomplete/Unclear <input type="checkbox"/>   | Fit/Function <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Misread <input type="checkbox"/>              | Substation <input type="checkbox"/>       | Process Improvement <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/>                                                                             | Drill Holes <input type="checkbox"/>          | Misaligned/off center <input type="checkbox"/> | Turning Sequence <input type="checkbox"/>   |
| Past Expiry Date <input type="checkbox"/>                    | Manufacturing Process <input type="checkbox"/> | OTHER : _____                                                                                                                                                                      |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>              |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                           |                                              |                                                                                                                    |                                               |                                                |                                             |



**Work Order ID 164762**

Friday, July 28, 2017 9:29:18 AM

**\*164762\***

Page 7

Item ID: D4680-041 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: URF 17-547 Stop **\*NS2\***  
Item Name: Skidtube Assembly  
Start Date: 8/3/2017 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 9/1/2017 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                      | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|-----------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 270                            | QC5- Inspect part completeness to step on W/O | 0.00                 |         |        |              |               |               |                  |                |
| <b>*270*</b>                   |                                               |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                          | 0.02                 |         |        |              |               |               |                  |                |
| Quality Control                |                                               |                      |         |        |              |               |               |                  |                |
| 300                            | Identify as per dwg & Stock Location: _____   | 0.00                 |         |        |              |               |               |                  |                |
| <b>*300*</b>                   | Packaging                                     |                      |         |        |              |               |               |                  |                |
| Packaging                      | Memo                                          | 0.01                 |         |        |              |               |               |                  |                |
| Packaging                      |                                               |                      |         |        |              |               |               |                  |                |
| 310                            | QC21- Final Inspection - Work Order Release   | 0.00                 |         |        |              |               |               |                  |                |
| <b>*310*</b>                   |                                               |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                          | 0.10                 |         |        |              |               |               |                  |                |
| Quality Control                |                                               |                      |         |        |              |               |               |                  |                |

**POSITIVE RECALL****EFFECTIVE** JUL 28 2017**AUTH****RELEASED** DAS**DATE** 17-11-15

9-80

at reut

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                             |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                        |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |
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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                             | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                           | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                           |                                 |                                   |                                                                                                                        |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |
| Date : _____                                                 |                                             | Step #: _____                                                                                                                                                                      |                                           | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                           |                                 |                                   | MRB (QSI042) Approval                                                                                                  |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |
| Description Work Order Deviation                             |                                             |                                                                                                                                                                                    |                                           | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                                 |                                   | Completed By _____<br><br>Lead hand / Supervisor Approval Verification _____<br><br>QC / QA Coordinator Approval _____ |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |
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| Root Cause                                                   |                                             | FAULT CATEGORY                                                                                                                                                                     |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                        |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/> | Design <input type="checkbox"/> | Operator <input type="checkbox"/> | Bending <input type="checkbox"/>                                                                                       | Set-up <input type="checkbox"/> | Folio/Program <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Doc/Data <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Grain <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Equip/Tooling <input type="checkbox"/> | Supplier <input type="checkbox"/> | Cracks <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Weld <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Handling/Pre <input type="checkbox"/> | Training <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Material <input type="checkbox"/> | Use for Testing <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Contamination <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Crushing <input type="checkbox"/> | Countersink <input type="checkbox"/> | Off-set <input type="checkbox"/> | Drawing <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | Rushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Finish <input type="checkbox"/> | LOA <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misread <input type="checkbox"/> | Substation <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | OTHER : _____ |  |  |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>           |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                        |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |               |  |  |  |

# Picklist Print

Friday, July 28, 2017 9:29:17 AM

Page 1

Work Order ID: 164762

**\*164762\***

Parent Item: D4680-041

**\*D4680-041\***

Parent Item Name: Skidtube Assembly

Start Date: 8/3/2017

Required Date: 9/1/2017

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 13.04.16 NEW ISSUE DD VERF:JLM IPP  
REV:B 13.08.08 PB2 DD VERF:JLM IPP REV:C  
13.09.10 PB3 DD VERF:JLM IPP REV:D 13.11.14  
AS PER DWG REV.B DD VERF:JLM IPP REV:C 14.11.24 AS PER  
DWG REV.C DD VERF:JLM IPP REV:D 15.06.10 AS PER DWG  
REV.D DD VERF:JLM IPP REV:E 16.03.23 AS PER DWG REV.E  
DD VERF:JLM

| Component Item ID/<br>Item Name | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| AN526C1032R10                   |                        | Purchased     |             |                     |                  | 260             | Each               | 117.0000       | 2           | 2            |               |                |        |

**\*AN526C1032R10\***

Screw

**\*\***

Location

Loc Qty

Loc Code

FP001  
m135133  
ST327  
m137851

17  
17  
100  
100

CR3212-5-05

Purchased

No

170

Each

300.0000

68

68

**\*CR3212-5-05\***

Rivet

**\*\***

M6/ 17/08/30

Location

Loc Qty

Loc Code

CCK003  
m138040

300  
300

130238 x 64  
130325 x 64

D5304-1

Manufactured

No

260

Each

24.0000

2

2

**\*D5304-1\***

Crossbolt Spacer

**\*\***

SE1709-20

Location

Loc Qty

Loc Code

LG001  
145050  
146516  
161952

24  
4  
1  
19

2



DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                             |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |
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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                             | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                           | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |
| Date :                                                       |                                             | Step #:                                                                                                                                                                            |                                           | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                 |                                   | MRB (QSI042) Approval                                                                                              |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |
| Description Work Order Deviation                             |                                             |                                                                                                                                                                                    |                                           | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           |                                 |                                   | Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |
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| Root Cause                                                   |                                             | FAULT CATEGORY                                                                                                                                                                     |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Positioned Wrong <input type="checkbox"/> | Design <input type="checkbox"/> | Operator <input type="checkbox"/> | Bending <input type="checkbox"/>                                                                                   | Set-up <input type="checkbox"/> | Folio/Program <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Doc/Data <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Grain <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Equip/Tooling <input type="checkbox"/> | Supplier <input type="checkbox"/> | Cracks <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Weld <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Handling/Pre <input type="checkbox"/> | Training <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Material <input type="checkbox"/> | Use for Testing <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Contamination <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Crushing <input type="checkbox"/> | Countersink <input type="checkbox"/> | Off-set <input type="checkbox"/> | Drawing <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | Rushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Finish <input type="checkbox"/> | LOA <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misread <input type="checkbox"/> | Substation <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | OTHER :<br><br> |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>           |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |                 |  |

# Picklist Print

Friday, July 28, 2017 9:29:17 AM

Page 2

Work Order ID: 164762

**\*164762\***

Parent Item: D4680-041

**\*D4680-041\***

Parent Item Name: Skidtube Assembly

Start Date: 8/3/2017

Required Date: 9/1/2017

Start Qty: 1.00

Required Qty: 1.00

D5520-1

Manufactured No

120

Each

0.0000

2

2

**\*D5520-1\***

Doubler

**\*\***

NAS1149C0332R

Purchased No

260

Each

3,854.000

5

5

**\*NAS1149C0332R\***

WASHER

**\*\***

BE17080  
B163670 X2  
B165266 X2 mba  
17/08/30

## Location

## Loc Qty

## Loc Code

FP001

798

m137951

798

GA

502

m133284

22

m136444

480

ST260a

1946

m137851

1946

ST266

608

m137381

608

D4680-041-BENT

Manufactured No

120

Each

8.0000

1

1

**\*D4680-041-BENT\***

Extrusion Bent

**\*\***

BE170803

## Location

## Loc Qty

## Loc Code

LG002

8

163755

8

D4681-041

Manufactured No

170

Each

5.0000

1

1

**\*D4681-041\***

Web Assembly

**\*\***

mba 17/08/30

## Location

## Loc Qty

## Loc Code

LG002

5

146247

5

Friday, July 28, 2017 9:29:17 AM

Shop Packet Print

Page 2

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                          |  |                                              |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Step #: _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | MRB (QSI042) Approval                        |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Completed By                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Lead hand / Supervisor Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | QC / QA Coordinator Approval                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                              |  |
| <div style="display: flex;"> <div style="flex: 1;">           Environment <input type="checkbox"/><br/>           Design <input type="checkbox"/><br/>           Doc/Data <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Pre <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Internal Transport <input type="checkbox"/><br/>           Tribal Knowledge <input type="checkbox"/><br/>           LOA <input type="checkbox"/><br/>           Substation <input type="checkbox"/><br/>           Past Expiry Date <input type="checkbox"/><br/>           Misidentified <input type="checkbox"/> </div> <div style="flex: 1;">           No Re-verification <input type="checkbox"/><br/>           Operator <input type="checkbox"/><br/>           Offset/Setup <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Training <input type="checkbox"/><br/>           Use for Testing <input type="checkbox"/><br/>           Poor Information <input type="checkbox"/><br/>           Rushing <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Past Due <input type="checkbox"/> </div> </div> | <div style="display: flex;"> <div style="flex: 1;">           Pressure/Forced <input type="checkbox"/><br/>           Bending <input type="checkbox"/><br/>           Centre Not Concentric <input type="checkbox"/><br/>           Cracks <input type="checkbox"/><br/>           Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>           Cuffs <input type="checkbox"/><br/>           Crushing <input type="checkbox"/><br/>           Heat Treat <input type="checkbox"/><br/>           Wave/Twist in Tube <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/> </div> <div style="flex: 1;">           Temperature/Cure <input type="checkbox"/><br/>           Set-up <input type="checkbox"/><br/>           BOM/Route <input type="checkbox"/><br/>           Broken/Damage/Defect <input type="checkbox"/><br/>           Inspection Incomplete/Unqualified <input type="checkbox"/><br/>           Contamination <input type="checkbox"/><br/>           Countersink <input type="checkbox"/><br/>           Cut Too Short <input type="checkbox"/><br/>           Instructions Incomplete/Unclear <input type="checkbox"/><br/>           Drill Holes <input type="checkbox"/> </div> </div> | <div style="display: flex;"> <div style="flex: 1;">           Power Loss/Surge <input type="checkbox"/><br/>           Folio/Program <input type="checkbox"/><br/>           Grain <input type="checkbox"/><br/>           Weld <input type="checkbox"/><br/>           Wrong Stock Pulled <input type="checkbox"/><br/>           Out of Sequence <input type="checkbox"/><br/>           Off-set <input type="checkbox"/><br/>           Mislabeled <input type="checkbox"/><br/>           Fit/Function <input type="checkbox"/><br/>           Misaligned/off center <input type="checkbox"/> </div> <div style="flex: 1;">           Positioned Wrong <input type="checkbox"/><br/>           Outside Dimensions <input type="checkbox"/><br/>           Over/Under tolerance <input type="checkbox"/><br/>           Part Incorrect <input type="checkbox"/><br/>           Part Lost/Missing <input type="checkbox"/><br/>           Part Moved <input type="checkbox"/><br/>           Drawing <input type="checkbox"/><br/>           Finish <input type="checkbox"/><br/>           Misread <input type="checkbox"/><br/>           Turning Sequence <input type="checkbox"/> </div> </div> |  |                                              |  |
| OTHER : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |



# Picklist Print

Friday, July 28, 2017 9:29:17 AM

Page 3

Work Order ID: 164762

**\*164762\***

Parent Item: D4680-041

**\*D4680-041\***

Parent Item Name: Skidtube Assembly

Start Date: 8/3/2017

Required Date: 9/1/2017

Start Qty: 1.00

Required Qty: 1.00

D4686-1 Manufactured No

260 Each 64.0000 8 8

**\*D4686-1\***

Spacer

**\*\***

*BE 17-09-20*

Location

Loc Qty

Loc Code

LG001

64

145075

44

146515

20

D4753-1 Manufactured No

260 Each 53.0000 16 16

**\*D4753-1\***

Doubler

**\*\***

*BE 17-09-18*

*B 16499/x16*

Location

Loc Qty

Loc Code

LG001

53

153498

7

161929

23

162891

23

AEELS-1032-130 AEELS8-1032-130 Purchased No

260 Each 0.0000 3 3

**\*AFI S-1032-130\***

Rivnut

**\*\***

Friday, July 28, 2017 9:29:17 AM

Shop Packet Print

Page 3

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                              |  |
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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                              |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Step #: _____                                                                                                                                                                      | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | MRB (QSI042) Approval                        |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                    | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Completed By                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Lead hand / Supervisor Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | QC / QA Coordinator Approval                 |  |
| <b>Root Cause</b><br><div style="display: flex;"> <div style="flex: 1;">           Environment <input type="checkbox"/><br/>           Design <input type="checkbox"/><br/>           Doc/Data <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Pre <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Internal Transport <input type="checkbox"/><br/>           Tribal Knowledge <input type="checkbox"/><br/>           LOA <input type="checkbox"/><br/>           Substation <input type="checkbox"/><br/>           Past Expiry Date <input type="checkbox"/><br/>           Misidentified <input type="checkbox"/> </div> <div style="flex: 1;">           No Re-verification <input type="checkbox"/><br/>           Operator <input type="checkbox"/><br/>           Offset/Setup <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Training <input type="checkbox"/><br/>           Use for Testing <input type="checkbox"/><br/>           Poor Information <input type="checkbox"/><br/>           Rushing <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Past Due <input type="checkbox"/> </div> </div> |                                                                                                                                                                                    | <b>FAULT CATEGORY</b><br><div style="display: flex;"> <div style="flex: 1;">           Pressure/Forced <input type="checkbox"/><br/>           Bending <input type="checkbox"/><br/>           Centre Not Concentric <input type="checkbox"/><br/>           Cracks <input type="checkbox"/><br/>           Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>           Cuffs <input type="checkbox"/><br/>           Crushing <input type="checkbox"/><br/>           Heat Treat <input type="checkbox"/><br/>           Wave/Twist in Tube <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/> </div> <div style="flex: 1;">           Temperature/Cure <input type="checkbox"/><br/>           Set-up <input type="checkbox"/><br/>           BOM/Route <input type="checkbox"/><br/>           Broken/Damage/Defect <input type="checkbox"/><br/>           Inspection Incomplete/Unqualified <input type="checkbox"/><br/>           Contamination <input type="checkbox"/><br/>           Countersink <input type="checkbox"/><br/>           Cut Too Short <input type="checkbox"/><br/>           Instructions Incomplete/Unclear <input type="checkbox"/><br/>           Drill Holes <input type="checkbox"/> </div> <div style="flex: 1;">           Power Loss/Surge <input type="checkbox"/><br/>           Folio/Program <input type="checkbox"/><br/>           Grain <input type="checkbox"/><br/>           Weld <input type="checkbox"/><br/>           Wrong Stock Pulled <input type="checkbox"/><br/>           Out of Sequence <input type="checkbox"/><br/>           Off-set <input type="checkbox"/><br/>           Misabeled <input type="checkbox"/><br/>           Fit/Function <input type="checkbox"/><br/>           Misaligned/off center <input type="checkbox"/> </div> <div style="flex: 1;">           Positioned Wrong <input type="checkbox"/><br/>           Outside Dimensions <input type="checkbox"/><br/>           Over/Under tolerance <input type="checkbox"/><br/>           Part Incorrect <input type="checkbox"/><br/>           Part Lost/Missing <input type="checkbox"/><br/>           Part Moved <input type="checkbox"/><br/>           Drawing <input type="checkbox"/><br/>           Finish <input type="checkbox"/><br/>           Misread <input type="checkbox"/><br/>           Turning Sequence <input type="checkbox"/> </div> </div> |  |                                              |  |
| OTHER : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                              |  |

# Picklist Print

Friday, July 28, 2017 9:29:17 AM

Page 4

Work Order ID: 164762

**\*164762\***

Parent Item: D4680-041

**\*D4680-041\***

Parent Item Name: Skidtube Assembly

Start Date: 8/3/2017

Required Date: 9/1/2017

Start Qty: 1.00

Required Qty: 1.00

AN3C4A

Purchased

No

260

Each

1,141.000

3

3

**\*AN3C4A\***

**\*\***

Bolt

Location

Loc Qty

Loc Code

FG

20

122814

20

FP001

183

M136450

23

M136740

8

M136986

20

M137075

43

M137164

2

M137361

5

M137820

82

OVER002

925

M137507

150

M137587

250

M137963

400

M138040

125

ST350

13

M135704

13

MS20601-AD4W3

Purchased

No

260

Each

409.0000

32

32

**\*MS20601-AD4W3\***

**\*\***

Rivet

Location

Loc Qty

Loc Code

CCK004

100

m137963

100

LG001

199

m137459

3

m137820

196

ST308

110

m137587

110

*BE1709-28*  
*MB8238 x 30*

Friday, July 28, 2017 9:29:17 AM

Shop Packet Print

Page 4



DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                             |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
|--------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------|---------------------------------------------|-----------------------------------|---------------------------------------|------------------------------------------------|------------------------------------|--------------------------------|-----------------------------------------------|----------------------------------------|-----------------------------------|---------------------------------|-----------------------------------------------|-------------------------------|-----------------------------------------|---------------------------------------|-----------------------------------|-------------------------------------------------|------------------------------------------------------------|---------------------------------------------|--------------------------------------------|-----------------------------------|------------------------------------------|--------------------------------|----------------------------------------|------------------------------------------|-------------------------------------|---------------------------------------------|-------------------------------------------|-----------------------------------|--------------------------------------|----------------------------------|----------------------------------|-------------------------------------------|----------------------------------|-------------------------------------|----------------------------------------|-------------------------------------|---------------------------------|------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------------------|---------------------------------------|----------------------------------|-------------------------------------|----------------------------------------------|----------------------------------------|--------------------------------------|------------------------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------------|---------|--|--|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                             | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                           | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
| Date :                                                       |                                             | Step #:                                                                                                                                                                            |                                           | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   | MRB (QSI042) Approval                                                                                              |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
| Description Work Order Deviation                             |                                             |                                                                                                                                                                                    |                                           | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                                 |                                   | Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
|                                                              |                                             |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
|                                                              |                                             |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
| Root Cause                                                   |                                             | FAULT CATEGORY                                                                                                                                                                     |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/> | Design <input type="checkbox"/> | Operator <input type="checkbox"/> | Bending <input type="checkbox"/>                                                                                   | Set-up <input type="checkbox"/> | Folio/Program <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Doc/Data <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Grain <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Equip/Tooling <input type="checkbox"/> | Supplier <input type="checkbox"/> | Cracks <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Weld <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Handling/Pre <input type="checkbox"/> | Training <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Material <input type="checkbox"/> | Use for Testing <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Contamination <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Crushing <input type="checkbox"/> | Countersink <input type="checkbox"/> | Off-set <input type="checkbox"/> | Drawing <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | Rushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Finish <input type="checkbox"/> | LOA <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misread <input type="checkbox"/> | Substation <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | OTHER : |  |  |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>           |                                                                                                                                                                                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                 |                                   |                                                                                                                    |                                 |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                   |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |         |  |  |  |

# Picklist Print

Friday, July 28, 2017 9:29:17 AM

Page 5

Work Order ID: 164762

**\*164762\***

Parent Item: D4680-041

**\*D4680-041\***

Parent Item Name: Skidtube Assembly

Start Date: 8/3/2017

Required Date: 9/1/2017

Start Qty: 1.00

Required Qty: 1.00

D2965      Manufactured      No      260      Each      28.0000      1      1

**\*D2965\***

**\*\***

Cap

Location

Loc Qty

Loc Code

FP001

28

127852

28

AN3C5A

Purchased      No

260      Each

1,314.000

2

2

**\*AN3C5A\***

**\*\***

Bolt

Location

Loc Qty

Loc Code

FG

5

122800

5

FP001

443

M137361

443

OVER002

800

M137710

200

M137963

600

ST350

66

M135442

66

D2965-3

Manufactured      No

260      Each

66.0000

1

1

**\*D2965-3\***

**\*\***

Cap

Location

Loc Qty

Loc Code

FP001

66

126369

66

Friday, July 28, 2017 9:29:18 AM

Shop Packet Print

Page 5

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

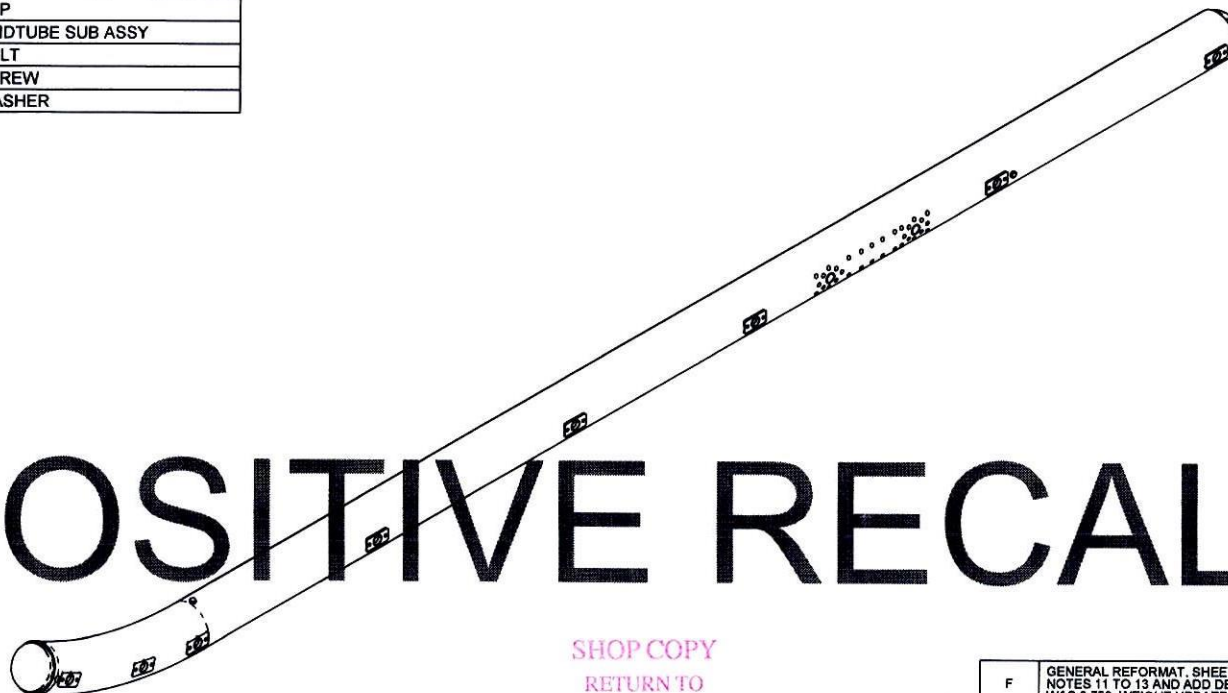
Work Order update only ☐

|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                              |  |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|-----------------------|----------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                                | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                                            | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                               |  |                       |                                              |  |
| Date : _____                                                 |                                                | Step #: _____                                                                                                                                                                      |                                                            | QTY Effective : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                               |  | MRB (QSI042) Approval |                                              |  |
| Description Work Order Deviation                             |                                                |                                                                                                                                                                                    |                                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |  |                       | Completed By                                 |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       | Lead hand / Supervisor Approval Verification |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       | QC / QA Coordinator Approval                 |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                              |  |
| Root Cause                                                   |                                                | FAULT CATEGORY                                                                                                                                                                     |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                              |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/>    | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/>                  | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/>     |  |                       |                                              |  |
| Design <input type="checkbox"/>                              | Operator <input type="checkbox"/>              | Bending <input type="checkbox"/>                                                                                                                                                   | Set-up <input type="checkbox"/>                            | Folio/Program <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outside Dimensions <input type="checkbox"/>   |  |                       |                                              |  |
| Doc/Data <input type="checkbox"/>                            | Offset/Setup <input type="checkbox"/>          | Centre Not Concentric <input type="checkbox"/>                                                                                                                                     | BOM/Route <input type="checkbox"/>                         | Grain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Over/Under tolerance <input type="checkbox"/> |  |                       |                                              |  |
| Equip/Tooling <input type="checkbox"/>                       | Supplier <input type="checkbox"/>              | Cracks <input type="checkbox"/>                                                                                                                                                    | Broken/Damage/Defect <input type="checkbox"/>              | Weld <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Part Incorrect <input type="checkbox"/>       |  |                       |                                              |  |
| Handling/Pre <input type="checkbox"/>                        | Training <input type="checkbox"/>              | Crimp/Kink/Ripple/Wave <input type="checkbox"/>                                                                                                                                    | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part Lost/Missing <input type="checkbox"/>    |  |                       |                                              |  |
| Material <input type="checkbox"/>                            | Use for Testing <input type="checkbox"/>       | Cuffs <input type="checkbox"/>                                                                                                                                                     | Contamination <input type="checkbox"/>                     | Out of Sequence <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Part Moved <input type="checkbox"/>           |  |                       |                                              |  |
| Internal Transport <input type="checkbox"/>                  | Poor Information <input type="checkbox"/>      | Crushing <input type="checkbox"/>                                                                                                                                                  | Countersink <input type="checkbox"/>                       | Off-set <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Drawing <input type="checkbox"/>              |  |                       |                                              |  |
| Tribal Knowledge <input type="checkbox"/>                    | Rushing <input type="checkbox"/>               | Heat Treat <input type="checkbox"/>                                                                                                                                                | Cut Too Short <input type="checkbox"/>                     | Mislabeled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Finish <input type="checkbox"/>               |  |                       |                                              |  |
| LOA <input type="checkbox"/>                                 | Product Improvement <input type="checkbox"/>   | Wave/Twist in Tube <input type="checkbox"/>                                                                                                                                        | Instructions Incomplete/Unclear <input type="checkbox"/>   | Fit/Function <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Misread <input type="checkbox"/>              |  |                       |                                              |  |
| Substation <input type="checkbox"/>                          | Process Improvement <input type="checkbox"/>   | Marks/Chatter <input type="checkbox"/>                                                                                                                                             | Drill Holes <input type="checkbox"/>                       | Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Turning Sequence <input type="checkbox"/>     |  |                       |                                              |  |
| Past Expiry Date <input type="checkbox"/>                    | Manufacturing Process <input type="checkbox"/> | OTHER : <input type="checkbox"/>                                                                                                                                                   |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                              |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>              |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |                       |                                              |  |



| ITEM | QTY<br>.041 | P/N           | DESCRIPTION       |
|------|-------------|---------------|-------------------|
|      | X           | D4680-041     | SKIDTUBE          |
| 1    | 1           | D2965         | CAP               |
| 2    | 1           | D2965-3       | CAP               |
| 3    | 1           | D4680-043     | SKIDTUBE SUB ASSY |
| 4    | 2           | AN3C5A        | BOLT              |
| 5    | 2           | AN526C1032R10 | SCREW             |
| 6    | 2           | NAS1149C0332R | WASHER            |

# POSITIVE RECALL



SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 164762

UM 17/7/28

#### NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: PAINT TOP SURFACE OF SKIDTUBE WITH MIL-W-5044 ANTI-SKID PAINT (WING WALK) AS INDICATED TO 1.00 ABOVE CENTERLINE PER QSI 005 SECTION 4.4
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D4680-041" AND B/N PER QSI 044 METHOD 6.4 ON INNER RADIUS OF SKIDTUBE BEFORE INSTALLING D2965 CAP
- 7) WEIGHT: 19.3 lbs
- 8) SEAL FAYING SURFACES WITH SIKAFLEX -241/-291 OR PROSEAL 890/1422 OR MIL-S-8802 CLASS B-2 SEALANT
- 9) INSTALL FASTENERS WET WITH SIKAFLEX -241/-291 OR PROSEAL 890/1422 OR MIL-S-8802 CLASS B-2 SEALANT

| F          | GENERAL REFORMAT. SHEET 3: ADD ITEMS 6 & 11 ADD NOTES 11 TO 13 AND ADD DETAIL H. SHEET 5: Ø0.188 WAS 0.750. WEIGHT UPDATE. ADD PROSEAL 1422                                                                                                                                   | AJS                                                                                                                                                                                                                                                                                  | 17.03.30     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| E          | GROUND HANDLING CROSSBOLT SPACERS NOW SWAGED, WAS WELDED, REMOVED D3492-055 PLUG ASSEMBLIES                                                                                                                                                                                   | AP                                                                                                                                                                                                                                                                                   | 15.11.02     |
| D          | MOVED AFT GROUNDING FASTENER HOLE AFT 0.25 DUE TO INTERFERENCE, ADDED NOTE 9 (SHT 1), GROUNDING STRAP WASHERS NOW STAINLESS                                                                                                                                                   | AP                                                                                                                                                                                                                                                                                   | 15.03.04     |
| C          | NAS1149F0332P WAS AN960-10L, AN526C1032R10 WAS AN526C1032-10, FWD GROUNDING STRAP FASTENER MOVED AFT (C5-3), Ø0.750 WAS Ø0.758 (B4-3).                                                                                                                                        | AP                                                                                                                                                                                                                                                                                   | 14.07.29     |
| B          | FWD CAP WAS D2965, NOW D2965-3, VARIOUS DIMENSIONAL CHANGES. D3492-055 PLUG ASSY WAS D3492-051, SWAGING DIMENSION NOW 0.650 WAS 0.661 (D6-2), ADDED DETAIL H (C2-3), MATERIAL D2962-150 WAS D2962-131 (A7-3), GROUND HANDLING THRU HOLES NOW WELDED, ADDED SECTION G-G (D3-2) | AP                                                                                                                                                                                                                                                                                   | 13.09.10     |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                     | AP                                                                                                                                                                                                                                                                                   | 13.02.13     |
| REV.       | DESCRIPTION                                                                                                                                                                                                                                                                   | BY                                                                                                                                                                                                                                                                                   | DATE         |
| DESIGN     | AP                                                                                                                                                                                                                                                                            | <b>DART AEROSPACE USA, INC.</b><br>EUGENE, OR                                                                                                                                                                                                                                        |              |
| DRAWN      | AJS                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                      |              |
| CHECKED    | ML                                                                                                                                                                                                                                                                            | DRAWING NO.                                                                                                                                                                                                                                                                          | REV. F       |
| MFG. APPR. | DP                                                                                                                                                                                                                                                                            | D4680                                                                                                                                                                                                                                                                                | SHEET 1 OF 5 |
| APPROVED   | WM                                                                                                                                                                                                                                                                            | TITLE                                                                                                                                                                                                                                                                                | SCALE        |
| DE APPR.   | DS                                                                                                                                                                                                                                                                            | SKIDTUBE                                                                                                                                                                                                                                                                             | NTS          |
| DATE       | 17.03.30                                                                                                                                                                                                                                                                      | COPYRIGHT © 2013 BY DART AEROSPACE USA, INC.<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC. |              |

AN526C1032R10  
SCREW  
2 PL

D2965-3  
CAP

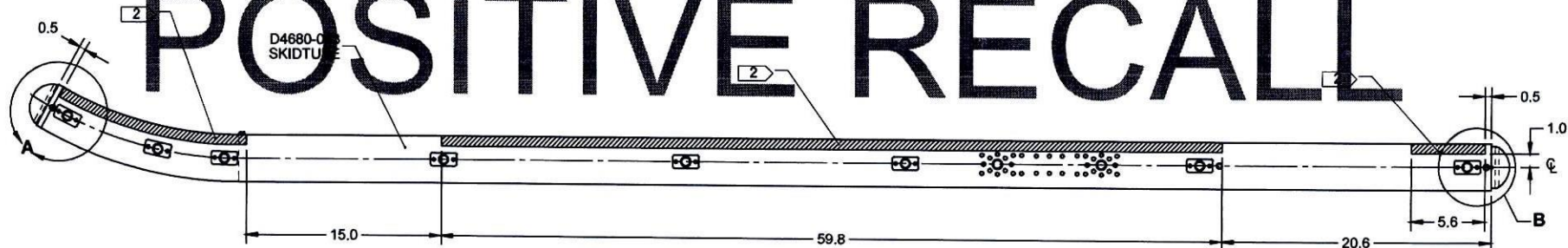
**DETAIL A**  
SCALE 4X

D2965  
CAP

AN3C5A BOLT  
NAS1149C0332R WASHER  
2 PL

**DETAIL B**  
SCALE 4X

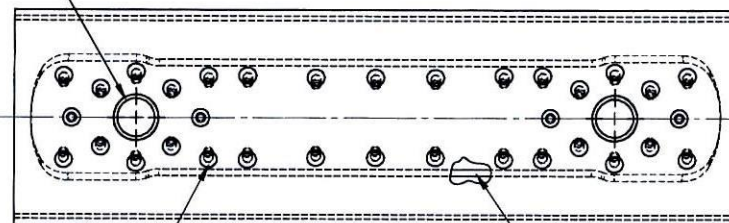
# POSITIVE RECALL



|            |          |                                                                                                                                                                                                                                                                                                             |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                                             |              |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                                                  |              |
| CHECKED    | ML       | DRAWING NO.                                                                                                                                                                                                                                                                                                 | REV. F       |
| MFG. APPR. | DP       | <b>D4680</b>                                                                                                                                                                                                                                                                                                | SHEET 2 OF 5 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                                                       | SCALE        |
| DE APPR.   | DS       | <b>SKIDTUBE</b>                                                                                                                                                                                                                                                                                             | NTS          |
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| ITEM | QTY | P/N           | DESCRIPTION           |
|------|-----|---------------|-----------------------|
|      | X   | D4680-043     | SKIDTUBE SUB ASSY     |
| 1    | 1   | D4680-1       | SKIDTUBE              |
| 2    | 1   | D4681-041     | WEB ASSY              |
| 3    | 8   | D4686-1       | SPACER                |
| 4    | 16  | D4753-1       | DOUBLER               |
| 5    | 2   | D5304-1       | CROSSBOLT SPACER      |
| 6    | 2   | D5520-1       | DOUBLER               |
| 7    | 3   | AN3C4A        | BOLT                  |
| 8    | 32  | MS20601AD4W3  | RIVET, BLIND, CSK     |
| 9    | 3   | NAS1149C0332R | WASHER                |
| 10   | 3   | AELS-1032-130 | INSERT                |
| 11   | 68  | CR3212-5-05   | CSK RIVET, CHERRY MAX |

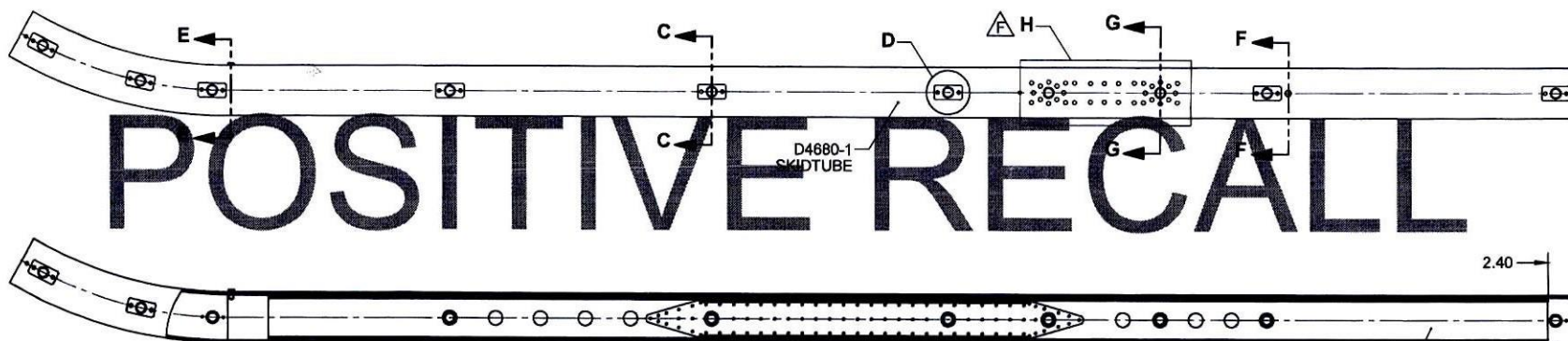
OPEN TO  
Ø0.750  
THRU 2 PL



13 12 CR3212-5-05  
CSK RIVET, CHERRY MAX  
34 PL PER DOUBLER

DETAIL H  
SCALE 4X

11 D5520-1 DOUBLER  
2 PL



D4680-043 SKIDTUBE SUB ASSY

9 D4681-041  
WEB ASSY

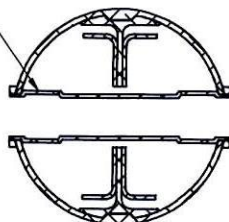
# NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: APPLY CHEMICAL CONVERSION COATING PER DART QSI 005 4.1 PRIOR TO INSTALLING D4681-041 WEB. POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 18.6 lbs
- 8) SEAL ALL MATING SURFACES USING PROSEAL 890/1422 OR MIL-S-8802 CLASS B2 SEALANT
- 9) INSERT D4681-041 WEB INTO D4680-1 SKIDTUBE IN LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX -241/-291 ADHESIVE PER DART QSI 015
- 10) INSTALL D4686-1 SPACER AFTER INSTALLING D4753-1 DOUBLERS
- 11) LOCATE THE D5520-1 DOUBLER USING THE Ø0.188 PILOT HOLES ON THE SKIDTUBE AND DOUBLER
- 12) LOCATE QTY (34) HOLES ONTO THE SKIDTUBE PER D5520-1 DOUBLER AND DRILL Ø0.161 THRU SKIDTUBE AND DOUBLER USING DT10309
- 13) COUNTERSINK THE SKIDTUBE Ø0.286 X 100° (34 PL) AND INSTALL EACH D5520-1 DOUBLER USING QTY (34) CR3212-5-05 CSK RIVETS

|            |          |                                                                                                                                                                                                                                                                                     |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                          |              |
| CHECKED    | ML       | DRAWING NO.                                                                                                                                                                                                                                                                         | REV. F       |
| MFG. APPR. | DP       | D4680                                                                                                                                                                                                                                                                               | SHEET 3 OF 5 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | DS       | SKIDTUBE                                                                                                                                                                                                                                                                            | NT           |
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D4686-1  
SPACER

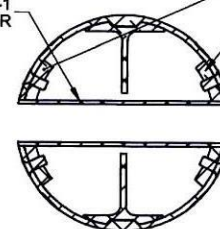


INSTALL D4686-1 SPACER AS FOLLOWS (8 PL)  
AFTER INSTALLING D4753-1 DOUBLERS PER DETAIL D

1. INSERT D4686-1 SPACER
2. SWAGE TO  $\phi 0.650 +0.010/-0.000$  X 1.0
3. DEEP PER QSI 002
3. TRIM/GRIND FLUSH PER QSI 002

SECTION C-C  
SCALE 4X  
8 PL

D5304-1  
CROSSBOLT SPACER



D5520-1 DOUBLER  
REF

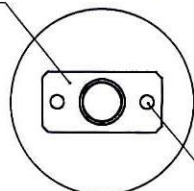
INSTALL D5304-1 SPACER AS FOLLOWS (2 PL)

1. INSERT D5304-1 SPACER
2. SWAGE TO  $\phi 0.565 +0.005/-0.000$  X 1.0
3. DEEP PER QSI 002
3. OPEN THRU HOLE TO  $\phi 0.625$

SECTION G-G  
SCALE 4X  
2 PL

# POSITIVE RECALL

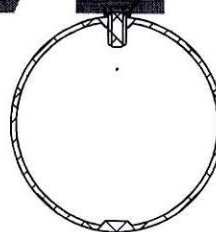
D4753-1  
DOUBLER



MS20601AD4W3  
RIVET, BLIND, CSK  
2 PL

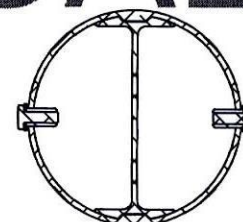
DETAIL D  
16 PL (BOTH SIDES)  
SCALE 4X

AN304A BOLT  
NAS1149C0332R WASHER  
AELS-1032-130 INSERT



SECTION E-E  
SCALE 4X

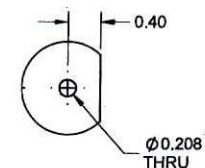
AN304A BOLT  
NAS1149C0332R WASHER  
AELS-1032-130 INSERT  
2 PL



SECTION F-F  
SCALE 4X

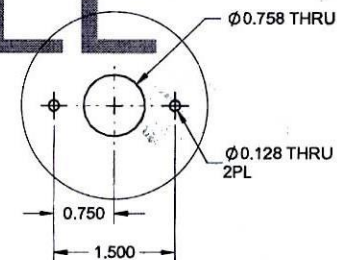
|            |          |                                                                                                                                                                                                                                                                                     |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                          |              |
| CHECKED    | ML       | DRAWING NO.                                                                                                                                                                                                                                                                         | REV. F       |
| MFG. APPR. | DP       | D4680                                                                                                                                                                                                                                                                               | SHEET 4 OF 5 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | DS       | SKIDTUBE                                                                                                                                                                                                                                                                            | NTS          |
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**D4680-1 SKIDTUBE BENDING/TRIMMING DETAIL**



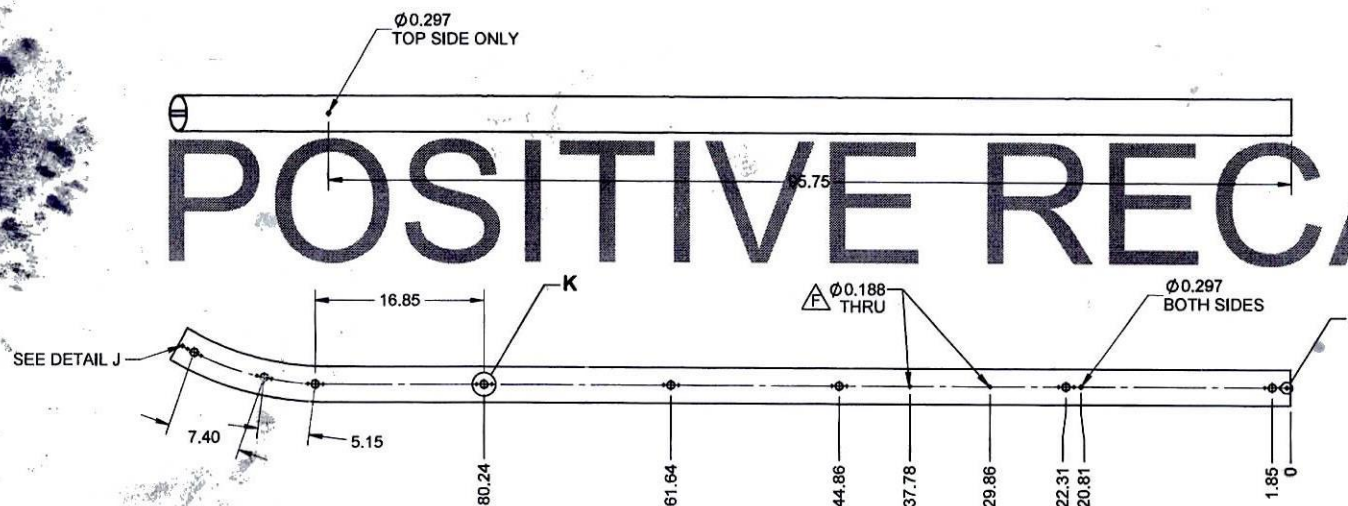
**DETAIL J**  
SCALE 8X  
2 PL

**POSITIVE RECALL**



**DETAIL K**  
SCALE 8X  
8 PL

**D4680-1 SKIDTUBE DRILLING DETAIL**

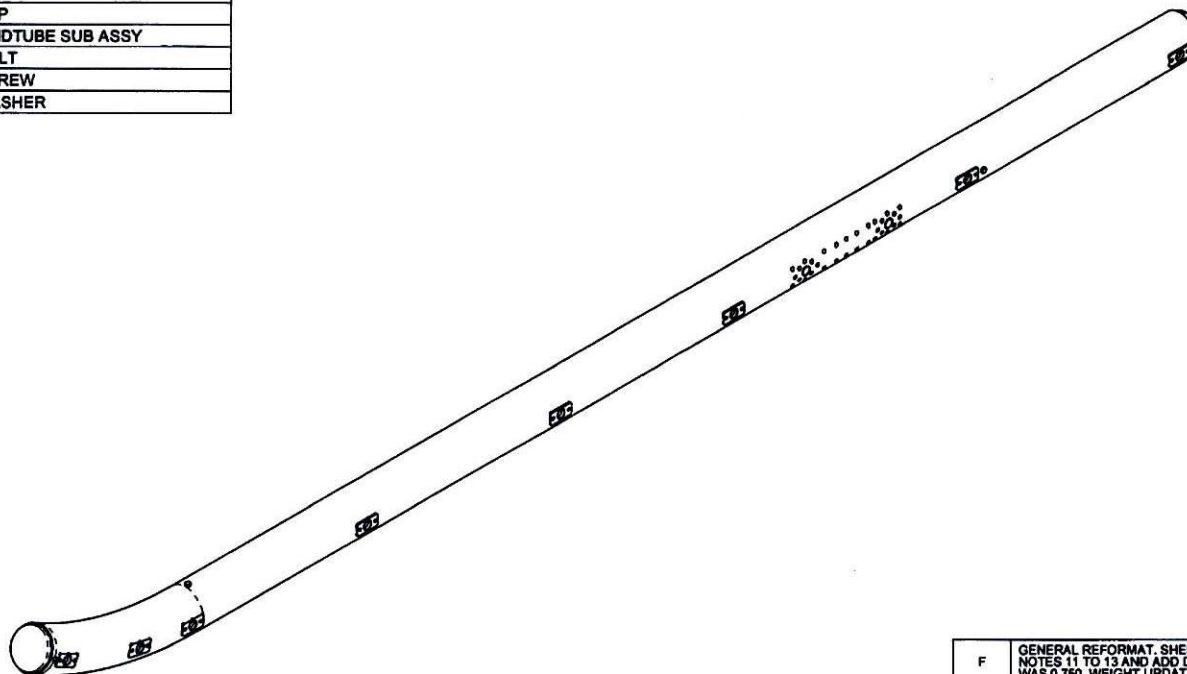


**NOTES:**

- 1) MATERIAL: MAKE FROM D2962-150 EXTRUSION
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 11.36 lbs

|            |          |                                                                                                                                                                                                                                                                                                     |              |
|------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                                          |              |
| CHECKED    | ML       | DRAWING NO.                                                                                                                                                                                                                                                                                         | REV. F       |
| MFG. APPR. | DP       | D4680                                                                                                                                                                                                                                                                                               | SHEET 5 OF 5 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | DS       | SKIDTUBE                                                                                                                                                                                                                                                                                            | NTS          |
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| ITEM | QTY<br>-041 | P/N           | DESCRIPTION       |
|------|-------------|---------------|-------------------|
|      | X           | D4680-041     | SKIDTUBE          |
| 1    | 1           | D2965         | CAP               |
| 2    | 1           | D2965-3       | CAP               |
| 3    | 1           | D4680-043     | SKIDTUBE SUB ASSY |
| 4    | 2           | AN3C5A        | BOLT              |
| 5    | 2           | AN526C1032R10 | SCREW             |
| 6    | 2           | NAS1149C0332R | WASHER            |



# NOTES:

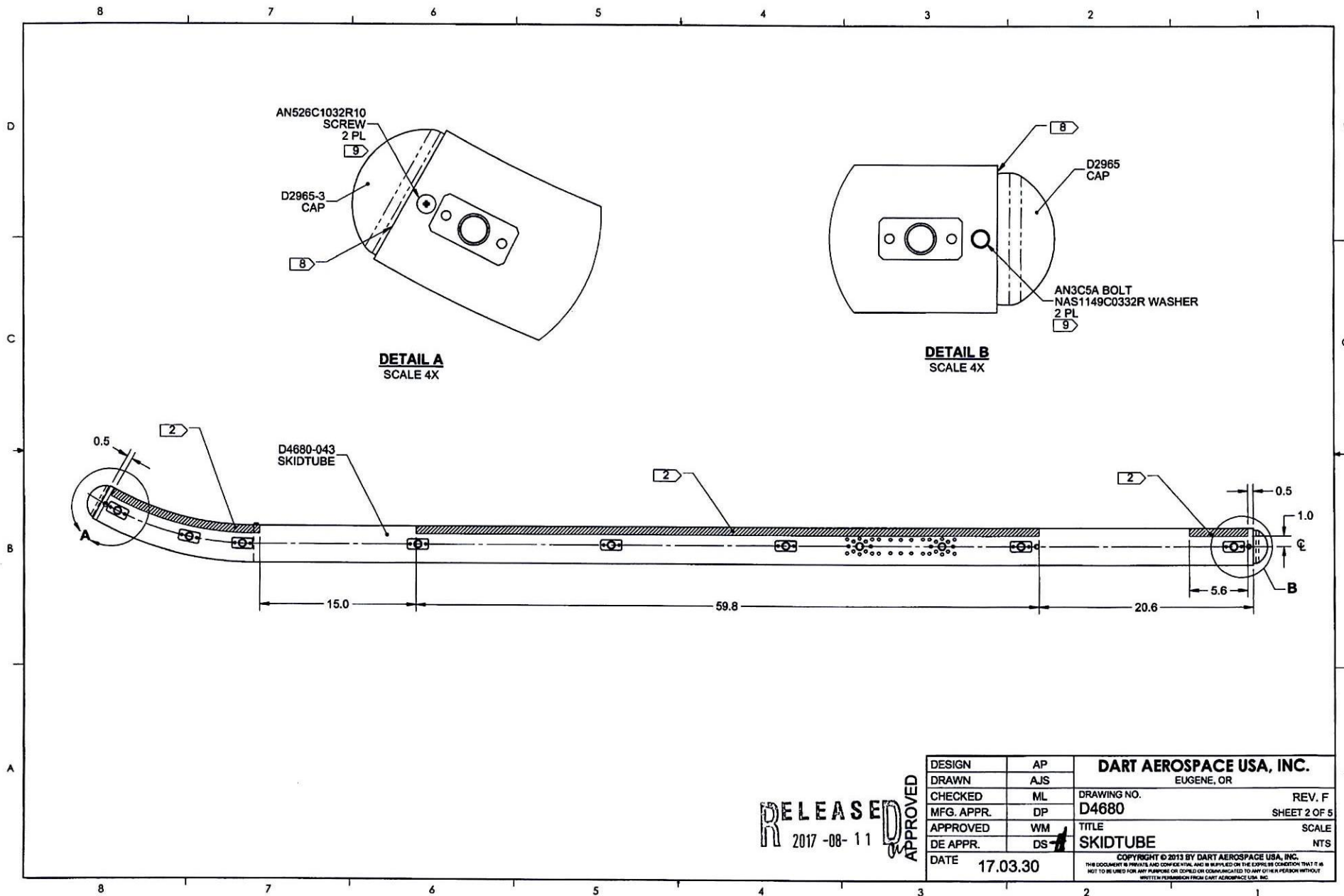
- 1) MATERIAL: N/A
- 2) FINISH: PAINT TOP SURFACE OF SKIDTUBE WITH MIL-W-5044 ANTI-SKID PAINT (WING WALK) AS INDICATED TO 1.00 ABOVE CENTERLINE PER QSI 005 SECTION 4.4
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D4680-041" AND B/N PER QSI 044 METHOD 6.4 ON INNER RADIUS OF SKIDTUBE BEFORE INSTALLING D2965 CAP
- 7) WEIGHT: 19.3 lbs
- 8) SEAL FAYING SURFACES WITH SIKAFLEX -241/-291 OR PROSEAL 890/1422 OR MIL-S-8802 CLASS B-2 SEALANT
- 9) INSTALL FASTENERS WET WITH SIKAFLEX -241/-291 OR PROSEAL 890/1422 OR MIL-S-8802 CLASS B-2 SEALANT

| F          | GENERAL REFORMAT. SHEET 3: ADD ITEMS 8 & 11 ADD NOTES 11 TO 13 AND ADD DETAIL H, SHEET 5: Ø0.188 WAS 0.750, WEIGHT UPDATE, ADD PROSEAL 1422                                                                                                                                  | AJS                                                                                                                                                                                                                                                                                  | 17.03.30     |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| E          | GROUND HANDLING CROSSBOLT SPACERS NOW SWAGED, WAS WELDED, REMOVED D3492-055 PLUG ASSEMBLIES                                                                                                                                                                                  | AP                                                                                                                                                                                                                                                                                   | 15.11.02     |
| D          | MOVED AFT GROUNDING FASTENER HOLE AFT 0.25 DUE TO INTERFERENCE, ADDED NOTE 9 (SHT 1), GROUNDING STRAP WASHERS NOW STAINLESS                                                                                                                                                  | AP                                                                                                                                                                                                                                                                                   | 15.03.04     |
| C          | NAS1149F0332P WAS AN980-10L, AN526C1032R10 WAS AN526C1032-10, FWD GROUNDING STRAP FASTENER MOVED AFT (CS-3), Ø0.750 WAS Ø0.758 (B4-3).                                                                                                                                       | AP                                                                                                                                                                                                                                                                                   | 14.07.29     |
| B          | FWD CAP WAS D2965 NOW D2965-3, VARIOUS DIMENSIONAL CHANGES: D3492-055 PLUG ASSY WAS D3492-051, SWAGING DIMENSION NOW 0.850 WAS 0.661 (D8-2), ADDED DETAIL H (C2-3), MATERIAL D2962-150 WAS D2962-131 (A7-3), GROUND HANDLING THRU HOLES NOW WELDED, ADDED SECTION G-G (D3-2) | AP                                                                                                                                                                                                                                                                                   | 13.09.10     |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                    | AP                                                                                                                                                                                                                                                                                   | 13.02.13     |
| REV.       | DESCRIPTION                                                                                                                                                                                                                                                                  | BY                                                                                                                                                                                                                                                                                   | DATE         |
| DESIGN     | AP                                                                                                                                                                                                                                                                           | <b>DART AEROSPACE USA, INC.</b><br>EUGENE, OR                                                                                                                                                                                                                                        |              |
| DRAWN      | AJS                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                      |              |
| CHECKED    | ML                                                                                                                                                                                                                                                                           | DRAWING NO.                                                                                                                                                                                                                                                                          | REV. F       |
| MFG. APPR. | DP                                                                                                                                                                                                                                                                           | D4680                                                                                                                                                                                                                                                                                | SHEET 1 OF 5 |
| APPROVED   | WM                                                                                                                                                                                                                                                                           | TITLE                                                                                                                                                                                                                                                                                | SCALE        |
| DE APPR.   | DS                                                                                                                                                                                                                                                                           | SKIDTUBE                                                                                                                                                                                                                                                                             | NTS          |
| DATE       | 17.03.30                                                                                                                                                                                                                                                                     | COPYRIGHT © 2013 BY DART AEROSPACE USA, INC.<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC. |              |

RELEASED  
2017-08-11  
ECN 17-547

APPROVED





RELEASED  
2017-08-11

APPROVED

|            |          |                                                                                                                                                                                                                                                                                                               |        |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                                               |        |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                                                    |        |
| CHECKED    | ML       | DRAWING NO. <b>D4680</b>                                                                                                                                                                                                                                                                                      | REV. F |
| MFG. APPR. | DP       | SHEET 2 OF 5                                                                                                                                                                                                                                                                                                  |        |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                                                         | SCALE  |
| DE APPR.   | DS       | <b>SKIDTUBE</b>                                                                                                                                                                                                                                                                                               | NTS    |
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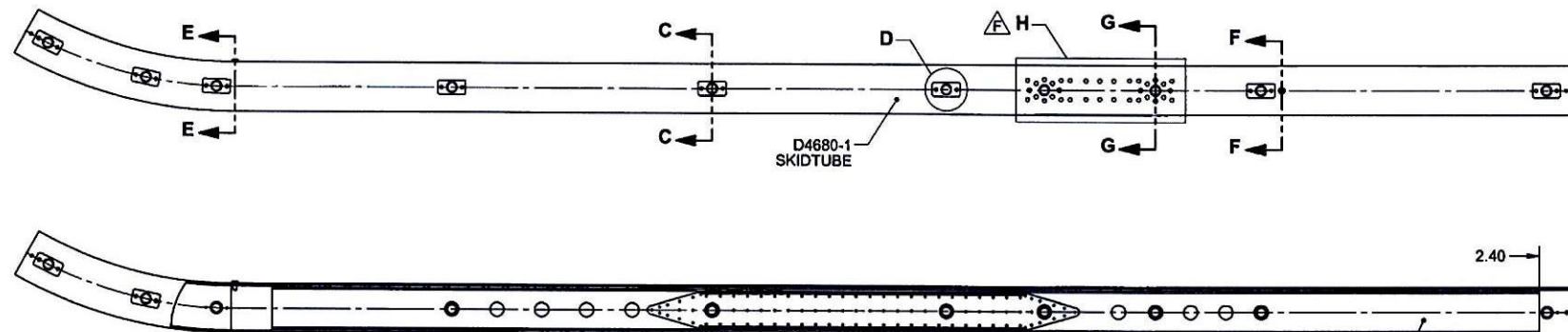
| ITEM | QTY | P/N           | DESCRIPTION           |
|------|-----|---------------|-----------------------|
|      | X   | D4680-043     | SKIDTUBE SUB ASSY     |
| 1    | 1   | D4680-1       | SKIDTUBE              |
| 2    | 1   | D4681-041     | WEB ASSY              |
| 3    | 8   | D4686-1       | SPACER                |
| 4    | 16  | D4753-1       | DOUBLER               |
| 5    | 2   | D5304-1       | CROSSBOLT SPACER      |
| 6    | 2   | D5520-1       | DOUBLER               |
| 7    | 3   | AN3C4A        | BOLT                  |
| 8    | 32  | MS20601AD4W3  | RIVET, BLIND, CSK     |
| 9    | 3   | NAS1149C0332R | WASHER                |
| 10   | 3   | AELS-1032-130 | INSERT                |
| 11   | 68  | CR3212-5-05   | CSK RIVET, CHERRY MAX |

OPEN TO  
Ø0.750  
THRU 2 PL

13 12 CR3212-5-05  
CSK RIVET, CHERRY MAX  
34 PL PER DOUBLER

DETAIL H  
SCALE 4X

11 D5520-1 DOUBLER  
2 PL



D4680-043 SKIDTUBE SUB ASSY

9 D4681-041  
WEB ASSY

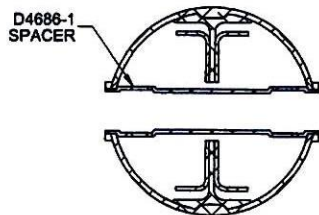
# NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: APPLY CHEMICAL CONVERSION COATING PER DART QSI 005 4.1 PRIOR TO INSTALLING D4681-041 WEB. POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 18.6 lbs
- 8) SEAL ALL MATING SURFACES USING PROSEAL 890/1422 OR MIL-S-8802 CLASS B2 SEALANT
- 9) INSERT D4681-041 WEB INTO D4680-1 SKIDTUBE IN LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX -241/-291 ADHESIVE PER DART QSI 015
- 10) INSTALL D4686-1 SPACER AFTER INSTALLING D4753-1 DOUBLERS
- 11) LOCATE THE D5520-1 DOUBLER USING THE Ø0.188 PILOT HOLES ON THE SKIDTUBE AND DOUBLER
- 12) LOCATE QTY (34) HOLES ONTO THE SKIDTUBE PER D5520-1 DOUBLER AND DRILL Ø0.161 THRU SKIDTUBE AND DOUBLER USING DT10309
- 13) COUNTERSINK THE SKIDTUBE Ø0.286 X 100° (34 PL) AND INSTALL EACH D5520-1 DOUBLER USING QTY (34) CR3212-5-05 CSK RIVETS

RELEASED  
2017-08-11

APPROVED

|                                                                                                                                                                                                                                  |          |                                              |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------|--------------|
| DESIGN                                                                                                                                                                                                                           | AP       | <b>DART AEROSPACE USA, INC.</b>              |              |
| DRAWN                                                                                                                                                                                                                            | AJS      | EUGENE, OR                                   |              |
| CHECKED                                                                                                                                                                                                                          | ML       | DRAWING NO.                                  | REV. F       |
| MFG. APPR.                                                                                                                                                                                                                       | DP       | D4680                                        | SHEET 3 OF 5 |
| APPROVED                                                                                                                                                                                                                         | WM       | TITLE                                        | SCALE        |
| DE APPR.                                                                                                                                                                                                                         | DS       | SKIDTUBE                                     | NTS          |
| DATE                                                                                                                                                                                                                             | 17.03.30 | COPYRIGHT © 2013 BY DART AEROSPACE USA, INC. |              |
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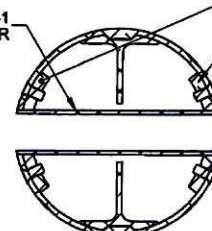


**SECTION C-C**  
SCALE 4X  
8 PL

INSTALL D4686-1 SPACER AS FOLLOWS (8 PL)  
AFTER INSTALLING D4753-1 DOUBLERS PER DETAIL D

1. INSERT D4686-1 SPACER
2. SWAGE TO  $\varnothing 0.650 +0.010/-0.000 \times 1.0$   
DEEP PER QSI 002
3. TRIM/GRIND FLUSH PER QSI 002

D5304-1  
CROSSBOLT SPACER



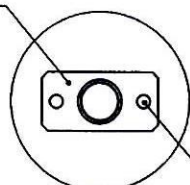
**SECTION G-G**  
SCALE 4X  
2 PL

D5520-1 DOUBLER  
REF

INSTALL D5304-1 SPACER AS FOLLOWS (2 PL)

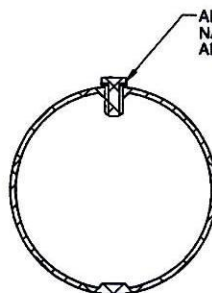
1. INSERT D5304-1 SPACER
2. SWAGE TO  $\varnothing 0.585 +0.005/-0.000 \times 1.0$   
DEEP PER QSI 002
3. OPEN THRU HOLE TO  $\varnothing 0.625$

**8**  
D4753-1  
DOUBLER



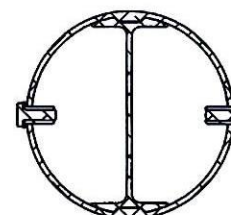
**DETAIL D**  
16 PL (BOTH SIDES)  
SCALE 4X

MS20601AD4W3  
RIVET, BLIND, CSK  
2 PL



**SECTION E-E**  
SCALE 4X

AN3C4A BOLT  
NAS1149C0332R WASHER  
AELS-1032-130 INSERT



**SECTION F-F**  
SCALE 4X

AN3C4A BOLT  
NAS1149C0332R WASHER  
AELS-1032-130 INSERT  
2 PL

RELEASED  
2017-08-11

APPROVED

|            |          |                                                                                                                                                                                                                                                                                     |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE USA, INC.</b>                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | EUGENE, OR                                                                                                                                                                                                                                                                          |              |
| CHECKED    | ML       | DRAWING NO.                                                                                                                                                                                                                                                                         | REV. F       |
| MFG. APPR. | DP       | <b>D4680</b>                                                                                                                                                                                                                                                                        | SHEET 4 OF 5 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | DS       | <b>SKIDTUBE</b>                                                                                                                                                                                                                                                                     | NTS          |
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